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MIDDLETON-GOLDSMITH LECTURE

BY

FRANCIS P. KINNICUTT, M.D.

NEW OUTLOOKS IN THE PROPHYLAXIS AND TREATMENT
OF TUBERCULOSIS

NEW OUTLOOKS IN THE PROPHYLAXIS AND TREATMENT OF TUBERCULOSIS.

GENTLEMEN :

When your Committee did me the honor to request my acceptance of the Middleton-Goldsmith lectureship of the present year and suggested the subject, "The Present Aspect of the Treatment of Tuberculous Disease, and Especially of Pulmonary Tuberculosis," my first inclination was to decline. Their representations, that a review of this subject was particularly desirable at the present time and would serve a practical purpose, have alone induced me to undertake a difficult task.

The lecture has been postponed beyond the customary time of its delivery, in the hope that investigations which have been carried on during the past winter in St. Luke's Hospital, and in the Pathological Laboratory of the College of Physicians and Surgeons, might be sufficiently advanced to be incorporated in it. This hope, in part, has been fulfilled.

Any consideration of methods of treatment of infectious diseases at the present time must necessarily be in the light of modern pathology and bacteriology. Through the discoveries in this field of medicine, the term treatment has acquired a new significance. A large number of the infectious diseases of human beings and of animals have already been shown to have their origin in specific pathogenic living organisms; and there are strong reasons for believing that a similar etiology will be demonstrated in the near future for all diseases hitherto included in this category.

In the infancy of bacteriology it was not unnaturally assumed that the sowing of the seed was alone necessary for the production of a disease; that if once the specific germ gained access to the economy its particular effects would certainly follow. The

"possession of a self-protecting power by the organism of man and of the higher animals, which could exercise its influence within certain limits, either in arresting the development of the living exciters of disease or in counteracting their poisonous products," was hardly dreamed of. To-day the splendid discoveries of bacteriological research have abundantly demonstrated that an unceasing contest is being waged between the growing power and toxic activity of the pathogenic microphyte and the living organism.

In this connection what can be of more absorbing interest than the discovery by the distinguished plant physiologist, Professor Pfeffer,¹ of the group of phenomena to which he gave the name of chemotaxis, the definite relation between vital movement and chemical action. Later it was suggested by Dr. Leber that the emigration of leucocytes in the human body was due to the same power. In other words, that certain harmful substances in the living tissues, embracing effete materials, living pathogenic organisms, and viruses of various kinds, are agreeable to a rudimentary sense of taste, as it were, in the leucocytes, which are thus allured from the media in which they commonly live toward the attracting substance.

The mustering of the leucocytes in troops, in the neighborhood of the bacterial invaders of the body, as a direct or indirect protection to it, is almost as dramatic as it is important. This action of the leucocytes, in virtue of their chemotaxis, and the final incorporation or digestion by them of the bacteria, constitutes Metschnikoff's well-known theory of phagocytosis and phagocytic immunity.

Further, we may refer to the investigations of Büchner² and Roemer, showing the association of a general leucocytosis with febrile inflammatory processes. They found that within eight hours after the intra-venous injection in rabbits of various proteids, there was marked leucocytosis; the relation of white to red blood-cells on the evening of the fourth day of the daily injection of solutions of the protein of the bacillus pyocyaneus (green pus) was 1 to 38, the absolute number of the red blood-cells remaining unchanged. It should be mentioned that the office of policeman, on the part of the leucocytes, is not considered proven at the present time by many. Their work as scavengers is acknowledged, but it is believed that the true guardianship of the body resides in the body fluids; in other words, that

the destruction of bacteria is accomplished by the germicidal power of the latter, and their removal only is effected by the leucocytes.

Finally, we may refer to the investigations, which have shown that, "while the living tissues and fluids of the body possess the power, in varying degree, of arresting the development of living, disease-producing organisms, and of eventually destroying them, certain life-products of the latter are capable of impairing or inhibiting this protective power."

In view of such facts, preventive medicine must necessarily embrace the means of promoting the victory of the organism in its contest, either by strengthening its defences or by weakening or destroying the power of the growing microphyte.

With our present knowledge of the various media in which the specific living excitors of disease most commonly lurk, it should be a matter of reproach if we fail in securing a more efficient prophylaxis than has been possible in the past.

Previous to 1882 the pulmonary lesions of tuberculosis had been accurately described, and Villemin, as a result of his successful inoculations of animals, had declared it to be a specific infectious disease. With the announcement of Koch, on March 14th of the above year, that he had discovered not only the constant accompaniment, but the cause of the tuberculous process, the infectious nature of tuberculosis was finally established, and the nature of the relation between specificity of cause and specificity of process in this disease was determined.

Before proceeding further it will be advantageous to have accurately pictured in our minds the pulmonary lesions which are directly or indirectly due to the tubercle bacillus. The list is indeed a formidable one. Miliary tubercles both single and conglomerate, larger and smaller areas of epitheloid cell-growth called diffuse tuberculous tissue, and various aggregations of these (often in a state of more or less advanced coagulation necrosis), disintegration, and excavation as a result of the latter, cicatricial formation, peri-bronchitis, and extensive inflammatory consolidations specific in nature; and finally we must bear in mind the bronchitis and lobular pneumonias, probably simple (unspecific) in character, so frequently present in tuberculous lungs.

In the light shed by modern research upon the possession by the organism of man of a self-protecting power against pathogenic

organisms, with a knowledge of the specific organism which causes tuberculosis and the lesions which are directly or indirectly produced by its presence in the economy, we are proportionately equipped to attempt to consider the measures, prophylactic and remedial, which have been proposed to cope with the disease.

Prophylactic measures must necessarily consist of those designed to destroy the vitality of the bacillus outside of the human body, to minimize the sources of infection, and to render the tissues insusceptible to its presence.

Three possibilities suggest themselves as *specific* means for exercising a *remedial* effect. They are : First, the discovery of a method of treatment capable of destroying the bacillus within the body ; second, of some substance, organic or inorganic, which by its introduction into the body may so modify the action of the bacillus as to deprive it of its harmful effects—the possible abstraction of a constituent of its protoplasm or of its metabolic products, analogous to the tetanus or pneumonic antitoxine, suggests in this connection ; third, the discovery of a principle capable on introduction into the economy of increasing the germicidal power of the fluids of the body by stimulating cell activity, upon which it ultimately depends, or by such stimulation inducing connective-tissue changes in tuberculous tissue, or both.

PROPHYLAXIS.

I shall first consider the prophylaxis of tuberculosis so far as it relates to destroying the vitality of the bacillus outside of the human body, and to minimizing the sources of infection. With the discovery of the specifically infectious nature of a disease, the means of infection are not necessarily directly evident. In tuberculosis a series of brilliant investigations quickly threw much light upon this point. Following Koch's discovery, it was very early shown that the bacilli were not contained in the air expired by patients suffering from pulmonary tuberculosis ; on the other hand, that their sputum contained bacilli in enormous numbers. It was further shown that the bacilli were incapable of escaping from fluid media, and, finally, that the sputum in a dry state, conveyed in the form of pulverized atoms by currents of air, was the most common source of infection. Successive investigations demonstrated that the stools of

human beings afflicted with the intestinal form of the disease and the discharges from tuberculous ulcers, glands, and bones were positive, if infrequent, vehicles of infection; and, finally, that the milk of tuberculous cows, with or without disease localized in the udder, and tuberculous meat, were capable of producing tuberculosis in the consumer.

It will be interesting to refer at somewhat greater length to inoculation experiments and clinical observations bearing on these points.

The elaborate investigations of Cornet³ in the Berlin Institute of Hygiene in regard to the distribution of the tubercle bacillus in the air are particularly instructive. The dust from twenty-one wards of seven hospitals, from three asylums, from two prisons, from the living-rooms of sixty-two phthisical patients in private practice, from "out-patient" departments, from the public streets, and from inhalation experiment rooms, was gathered and its virulence or innocuousness determined by inoculation of susceptible animals.

Of ninety-four animals inoculated with the dust of hospital wards, twenty became tuberculous. Virulent bacilli were obtained from fifteen out of twenty-one medical wards. Negative results, on the other hand, were obtained from the dust of the surgical wards, also from that of the streets and the inhalation rooms investigated. Of one hundred and seventy animals inoculated with the dust from the living-rooms of consumptives, thirty-four became infected. As ninety-one of the one hundred and seventy died of septic disease, it is probable that the above-mentioned percentage of animals in which tuberculosis was produced does not accurately represent the specific (tuberculous) virulence of such dust. The dust was taken from the walls, articles of furniture, picture frames, etc. From the room of a consumptive in a private house virulent bacilli was obtained six weeks after her death.

Cornet records the fact that he did not once find infective bacilli in the rooms of those patients who used only spittoons for the sputum, although especially careful search was made in these instances. Equally valuable evidence on this point is furnished by Trudeau.⁴ In his sanitarium at Saranac Lake, where rigid rules in regard to the use of proper receptacles for the sputum are enforced and its efficient disinfection or destruction is accomplished, not a single employee has acquired tuberculosis

during the six years since its institution. In Dettweiler's sanitarium at Falkenstein, where presumably similar precautions are taken, a similar experience is alleged.

With such observations before us, further *clinical* statistics may be unnecessary, but are not without interest.

In response to questions sent in 1883 by the Collective Investigation Committee of the British Medical Association to physicians throughout Great Britain,⁵ asking for their personal experience on the communicability of phthisis, 1,078 communications were received. Of these, 673 were to the effect that cases of tuberculosis originating in infection had not come under their notice. Of the remaining 405, 261 were regarded by the committee as positive in evidence of communicability, 39 as doubtful, and 105 as negative. Among the affirmative observers, 192 reported cases of probable infection of husband by wife and the converse, and in 130 of these cases there was an entire absence of inherited predisposition on the part of the person infected.

Turning to our own country, the investigations of Flick⁶ are of much interest. The localization of and mortality from tuberculosis in one of the wards of the city of Philadelphia for a period of twenty-five years preceding 1888 were very carefully studied by him. It is shown that while less than one third of the houses of the ward became infected with tuberculosis during the twenty-five years prior to 1888, considerably more than one half of the deaths from this disease during the year 1888 occurred in infected houses. Inasmuch as there were more than twice as many non-infected as infected houses in the ward, a preponderance of deaths in non-infected houses would be expected.

Cornet's investigations of the health statistics of the Catholic nursing orders of Prussia⁷ may be considered as supplementary to those of the same author which have already been described. Thirty-eight convents were selected, representing a yearly average of four thousand and twenty-eight persons, and the statistics relate to the twenty-five years preceding the year 1889. It is known that the general annual death-rate from tuberculous disease is from one seventh to one fifth of all deaths. Among the above-mentioned orders the enormous average mortality of 62.88 per cent. is shown to be due to tuberculosis alone. In nearly one half of the convents it even rises to seventy-five

per cent., and in two "mother-houses" it was the sole cause of death. In others the death-rate from this disease varies from forty to fifty per cent.

Cornet says that the different mortalities may be explained by the fact that some of the nurses are engaged in attending altogether or for the most part upon surgical cases. The average age at death of the inmates is 36.27 years, lower by ten years than that of men engaged in trades notoriously the most unhealthful—*i. e.*, file-cutters, copper-smiths, locksmiths, blacksmiths, cotton-spinners, etc.

If the mortality due to tuberculosis and that resulting from other diseases commonly regarded as infectious are both deducted from the death-rate in the Prussian state and in the convents, it is shown that up to the age of forty years the death-rates in state and convents are remarkably equal. From forty to sixty years the mortality due to non-infectious diseases is less in convent than in state. Even admitting the insanitary conditions of convent life, it is impossible to believe, with our present knowledge of the etiology of tuberculous disease, that it can produce it. On the other hand, these conditions are of the kind to lead to its rapid extension when once introduced. It should be mentioned that the health of all persons on entering the nursing communities is excellent, admission being dependent upon medical certificates to this effect.

Among the numerous investigations (⁸ ⁹ ¹⁰) of the infectiousness of the milk of tuberculous cows, I shall only refer to the very brilliant ones of our countryman, Dr. Ernst, of the Harvard Medical School. ¹¹ They surpass in their extent and importance those of Continental observers. Experimental inoculations in rabbits and guinea-pigs, and feeding experiments in calves and pigs with both the milk and cream of tuberculous cows *without* disease of the udder, proved in the most positive manner that such milk was capable of producing tuberculosis in the consumer. Incidentally, in experiments with milk taken at random from the common dairy supply of Boston, virulent bacilli were found in two instances.

If Dr. Ernst's experiments are supplemented with the clinical fact of the frequency of intestinal and mesenteric tuberculous disease in children, and with the statement, made in the form of a resolution, by the United States Veterinary Association in 1889 that from ten to fifteen per cent. of the dairy stock of the Eastern

States was tuberculous, this subject assumes very grave importance. Although investigations have shown that tuberculous meat as such is infective, further experiments are necessary to determine whether those parts of a tuberculous animal usually used for food, and not specifically affected, are harmful.

I have been able to collect a large number of cases of probable inoculation tuberculosis in the human being. Many of them occurred through infection of post-mortem and dissection wounds. Among others the following are of interest :

A healthy girl of fourteen years, without inherited predisposition, became locally infected through wearing the ear-rings of a consumptive. A tuberculous infiltration of the glands and general infection followed.¹²

A male child, very vigorous at birth, began to suffer when three years old from eczema of the skin of the abdomen. Bacilli were searched for, but not discovered. After four years of age, he constantly slept with his consumptive mother, and bacilli were shown to be present in the eczematous vesicles.¹³

A student received a slight wound in dissection; a nodule appeared at its site and a swelling of the glands of the forearm followed. The glands were excised and showed central cheesy degeneration.¹⁴

Ten Jewish boys were circumcised by the same physician only a short time before his death from consumption. There is positive evidence that the saliva of the operator came in contact with the preputial wounds. The first symptoms of infection developed ten days later. Three of the children died of tuberculous meningitis, three of marasmus, and one of intercurrent diarrhœa. Three survived, but developed tuberculous adenitis.¹⁵

Accumulated experimental and clinical investigations in demonstrating the most common sources of infection—viz., the sputum of patients suffering from pulmonary tuberculosis, the milk of tuberculous cows, and finally, though to a much less extent probably, tuberculous meat—clearly indicate the direction which prophylactic measures should take.

The enormous number of tubercle bacilli contained in the sputum of patients suffering from pulmonary tuberculosis, even admitting that many of them are dead, as Kitasato very recently has shown, is well known. In a series of investigations kindly made for me by Dr. T. Mitchell Prudden in 1891, as many as

21,460,000 were computed to be present in the daily sputum of a single patient. Nuttall's experiments,¹⁶ conducted in the Johns Hopkins laboratory, give quite similar results.

Sawizky¹⁷ has shown, moreover, that tuberculous sputum, dried and preserved under the conditions which usually obtain in the dwelling-house, preserves its infective properties for two months and a half.

Stone's experiments,¹⁸ if corroborated by further investigations, apparently show that its virulence may be extended for as long a period as three years. If we further consider the exceptional resistance of the tubercle bacillus to the action of both chemical and other antiseptics, the efficient disinfection or destruction of tuberculous sputum becomes a matter of vital importance.

CHEMICAL DISINFECTION.

Carbolic acid, potassa, sulphate of copper, and chloride of zinc, all in solutions of 1 to 500, were found by Grancher and de Genes to be useless.¹⁹ Histological examination of the sputum so treated showed no change in the appearance of the bacilli, and inoculations proved that they were still active. Later experiments²⁰ have demonstrated that carbolic acid, even in ten per cent. solution and after twenty-four hours' admixture with the sputum, is without effect. Corrosive sublimate is valueless, through the coagulation produced by it of the albuminoids contained in the sputum. The experimental investigations of Schottelius and Spengler,²⁰ with the newer antiseptics—creolin, aseptol, and lisol—of which much was hoped, have also been disappointing. Ten per cent. solutions of creolin and aseptol were found to be absolutely without effect, even after twenty-four hours. Lisol, however, in ten per cent. solution, proved to be capable of rendering the sputum sterile in twelve hours.

These results indicate in the most positive manner that we possess no practical means at present for efficiently disinfecting sputum by chemical antiseptics.

Experiments with heat, on the other hand, have shown that the tubercle bacilli rarely survive a temperature of 80° C., and are invariably killed at temperatures varying, according to different observers, from 90° to 100° C.²¹ Simple rinsing of the cups or other receptacles of the sputum with boiling water is not sufficient,

and is not without danger to the attendant. Numerous observers report cases of infection of cuts from sputum (v. Eiselsberg,²² Fleur,²³ Holst,²⁴ L. Pfeiffer,²⁵ and others).

In view of these facts, every consumptive should possess the knowledge that while his disease is in reality a menace to those about him, the foil is within his reach. He should be taught never to use a handkerchief for the sputum, never to spit upon the floor. An appropriate receptacle of glass, china, or paper, partially filled with water should be provided for the sputum, which should be thoroughly disinfected or destroyed at least once in twenty-four hours. For its disinfection in hospitals an ordinary Arnold's sterilizer, of sufficient size to accommodate all the cups of a ward, and in which they should be placed daily for a half hour, may be used.

A far better method, in my judgment, is the destruction of the sputum by fire. The method at present in successful use in St. Luke's Hospital, and which is of easy application in private houses, consists in the use of paper boxes, which are daily supplied to each patient, and at the end of twenty-four hours destroyed, with their contents, by fire. They are of convenient size, are very inexpensive, and the preparation used in their construction prevents all leakage. The floors and the walls of living rooms and of hospitals wards of consumptives should be scrubbed or wiped with damp cloths, not swept or dusted. The cast-off clothing of such patients should be submitted to the action of live steam or to the degree of heat described as sufficient to destroy the tubercle bacillus.

Public sentiment, in the absence of legislation, should compel the proprietors of hotels and boarding-houses, at health-resorts, at least, to take such measures as can be designated, with our present knowledge, for disinfecting the living-rooms of consumptives. Further investigations are urgently needed to determine the most efficient and practical means for accomplishing this object.

A further most important prophylactic measure consists in the systematic veterinary inspection of dairies, particularly those of large cities, and of slaughter-houses. Commercial considerations have secured the necessary legislation for the inspection of the pork products of the United States; a consideration of the public health should be sufficient to secure a similar legislation to minimize the sources of infection of tuberculous disease.

A bill for the inspection of dairies and the slaughter of tuberculous animals, I am happy to state, will probably be introduced in the legislative houses of the State of New York during the present session. Such an example, it is reasonable to hope, would gradually be followed by the Legislatures of other States.

In the meantime, in the absence of necessary legislation, the only safeguard possessed by the public against possible infection through dairy products consists in the sterilization of milk and cream by boiling, or through the use of steam sterilizers.*

Many of the prophylactic measures which have been mentioned have already been embodied in the form of suggestions or in laws by various governments and municipalities abroad, and the Board of Health of the City of New York has issued some admirable rules "to be observed for the prevention of the spread of consumption."

In considering the prophylaxis of tuberculosis I have purposely confined myself to measures designed to destroy the vitality of the bacillus outside of the human body, and to means for minimizing the sources of infection, in the belief that such efforts are of far greater relative value than those directed toward increasing the resisting power of the individual. I shall even go further, and thus cease to be open to the reproach that the clinician's interest in the therapeusis of the disease is almost to the exclusion of that in its prophylaxis, and assert that infinitely more can be accomplished toward the elimination of this terrible scourge by making practical use of our present exact knowledge of its etiology and prophylaxis than by any or all therapeutic measures at present at our command. As has been well said, "It is the seed of the disease, without the implantation of which there can be no harvest of death, that we are now most able to reach and destroy." We shall fail, then, in our duties as true physicians, if we do not scatter broadcast among the laity this knowledge. From a full appreciation of the dangers at their doors, and a knowledge of the means capable of diverting them, surely good fruit will be borne, even to the *enactment* and *enforcement* of laws for the protection of the public health.

In turning our attention to the remedial treatment of tuberculosis, our thoughts naturally are directed first to Koch's tuber-

* Investigations conducted in the Imperial Health Bureau of Berlin demonstrate that tubercle bacilli also retain their vitality in butter and cheese frequently for weeks.

culin.²⁶ His hypothesis of its specific mode of action is as follows : He particularly states that other explanations are possible and may be more correct. The tubercle bacilli in their growth produce in the living tissues, just as in artificial cultivations, certain substances which have various, but always deleterious, effects upon the living elements of their surroundings, the cells. Among these substances is one which, in a certain concentration destroys living protoplasm and causes it to undergo what is known as a coagulation necrosis. The necrotic tissue is unfavorable to the nutrition of the bacillus ; its further development is checked, and finally, in some cases, its death follows. If the amount of the necrosis producing substance be artificially augmented, as he believes it to be by the introduction of tuberculin into the system, not only will the extent of the necrosis be increased, and consequently the conditions of the nutrition of the bacilli be more unfavorably affected, but also more completely necrosed tissues will disintegrate and slough, and where this is possible, take with them the inclosed bacilli, carrying them outward. Large doses of tuberculin are capable of giving rise to a certain amount of pyrexia and other symptoms in healthy persons, he believes, through irritative influences exerted upon certain elements of the tissues, probably on the white corpuscles of the blood, or cells closely related to them.

The necrosis-producing substance in tuberculin Koch now tentatively believes to be an albumose, or a substance closely related to it. Many elaborate criticisms of this hypothesis, both theoretical and based upon experimental and clinical investigations, have appeared during the past year. In a very recent monograph by Rosenbach,²⁷ the author denies both a specific affinity of tuberculin for tuberculous tissue and the specific action claimed for it. The general reaction and constitutional disturbance following its inoculation he believes to be due to a general irritation set up in the body, which, according to its degree, can assume the characteristics of an inflammatory action, in some cases even of a purulent type. The degree of the reaction, particularly of the fever, depends upon the predisposition of the individual to febrile disturbance. Similar constitutional disturbances have been shown to follow the inoculation of cantharidal salts and the protein of other bacteria. Rosenbach asserts that the specific activity of tuberculin can only be demonstrated when it is proved that substances derived from other micro-organisms

can produce fever exclusively in subjects who are the hosts of bacteria of the same kind, and further, that they can evoke reaction only in the tissues in which changes have occurred from their action, and elsewhere remain without effect. He claims that hitherto this has not been shown. The author expresses a guarded opinion whether tuberculin produces an actual necrosis of tuberculous tissue ; if it occurs, he believes it is not a coagulation (specific) necrosis, but rather is secondary to an acute inflammatory process and exudation.

A new light has been thrown on the nature and action of tuberculin through the investigations of William Hunter, of England, and the German pathologist Klebs. As early as January, 1891, the former began his investigations.^{2*} Starting with the assertion of Koch that the remarkable properties possessed by it, unfortunately for evil as well as for good, were due to a single active principle which constituted but a fractional part of the extract, he believed that the chemical behavior of this hypothetical principle, which was described by the discoverer as a derivative of albuminoid bodies, could not possibly apply to any one known chemical substance.

His studies had for their object : 1. To isolate the chief constituents of tuberculin and to determine their chemical nature. 2. To ascertain their action with special reference to their power of inducing the two most characteristic effects of tuberculin, viz., local inflammation and fever. 3. To ascertain how far it was possible to eliminate all substances having an injurious action, and thus to obtain remedial without injurious effects.

His results may be summarized as follows, under the heads of composition, action, and therapeutic value. The chief substances found in tuberculin are : 1, Albumoses* ; 2, alkaloidal substances ; 3, extractives, small in quantity and of unrecognized nature ; 4, mucin ; 5, inorganic salts ; 6, glycerine and coloring matter.

Having ascertained that the only substances present in tuberculin with which its active properties could be associated were albumoses—organic bases of alkaloidal nature—and probably various extractives, he proceeded to determine, by experiments on mice and guinea-pigs, to which of the above substances tuberculin owed its characteristic properties, remedial and otherwise.

* Albumoses ; chiefly proto-albumose and deutero-albumose, along with hetero-albumose, and occasionally a trace of dys-albumose.

Four modifications of the original tuberculin were accordingly prepared by him. He has given to them the designation A, C, B, and CB, and these terms will be retained in the present paper.

From extensive investigation with these modifications he feels warranted in concluding—

1. That tuberculin owes its activity not to one principle, but to several ; that its action in producing local inflammation, fever, and general constitutional disturbance is not a simple but an extremely complex one.

2. That its remedial and inflammatory actions are connected with the presence of certain of its albumoses, while its fever-producing properties are chiefly associated with substances of a non-albuminous nature.

3. By the adoption of certain chemical methods, it is possible to remove the substances which cause the fever, while retaining those which are beneficial in their action.

4. That the fever produced by tuberculin is thus absolutely unessential to its remedial action. (He is inclined to believe that the inflammation is almost similarly unessential, although admitting that under certain circumstances it may assist the action of the remedial substance.)

5. That tuberculin possesses a truly remedial action, and that this is to be found in a protein, *i. e.*, in an albuminous substance derived from the plasma of the bacilli themselves, and not formed by their action upon the surrounding tissues, and finally, that it is possible to isolate largely this protein.

Dr. Hunter's clinical investigations, in which he has been assisted by Mr. Watson Cheyne, with the above modifications of tuberculin have led him to assert tentatively the following propositions: Modification A differs but slightly in its action from tuberculin. Modification C differs from tuberculin in being almost completely freed from the substance which gives rise to local inflammation. It contains, however, in a special degree, the fever-producing agents, which may be regarded as interfering with the remedial properties, and favoring rather than retarding the growth of the bacilli.

Modification CB contains the remedial substance present in C, freed from the fever-producing agents. Its use, moreover, is unattended with any of the other constitutional symptoms following the employment of tuberculin.

Modification B contains the remedial properties of CB, with

the additional property of inducing local inflammation. Its action is free, so far as has yet been observed, from ill effects.

From the marked improvement which Dr. Hunter has seen occur in cases of ulcerative and other forms of lupus, where it is possible to watch the local changes from day to day, under treatment both with B and CB, he believes the activity and probable remedial power of these modifications to be demonstrated.

It yet remains to be determined whether the improvement noted in his cases will be more or less permanent. The absence of marked local inflammation or of necrotic changes accompanying their use leaves the mode of action of the above modifications of tuberculin a matter of more or less speculation at the present time. I shall refer later to the clinical investigations of other observers, and to some personal ones, with Dr. Hunter's preparations.

Professor Klebs' researches have apparently been based on the same line of thought as the above, but were made quite independently of them.²⁹ Convinced that tuberculin produced in the human being many effects which had nothing to do with its action upon tuberculous tissue, and which could be avoided without affecting the latter property, he submitted tuberculin to various chemical processes with the view of freeing it from its alkaloidal substances. Its noxious properties reside in the latter he believes. He claims that the extracted principle represents the secretions of the tubercle bacilli, and is a pure albumose. Experimental investigations in animals indicate that the injection of large doses of tuberculocidin, as he terms the albumose, previous to inoculation with pure cultures of the bacillus, delays the development of tuberculosis to at least twice the usual period; moreover, that a complete resolution of previously developed tubercle may occur under its use.

The best results in animals were obtained when the tuberculocidin was injected simultaneously with inoculations of the bacilli. In such animals, killed three months later, tubercle was scantily present, and few bacilli were found. In cases where treatment was begun six weeks after experimental inoculation, and continued for twenty-five days, either complete healing or a high degree of retrogradation of the tuberculous lesions was observed.

Of seventy-five critically observed cases of pulmonary tuberculosis in the human being, treated with tuberculocidin, 18.6 per cent. are claimed to have been cured, and sixty per cent. improved. In a single case of supposed tuberculous meningitis the symptoms

also improved. Cases are reported in detail by Klebs in which a successful issue occurred, both tuberculin and creasote having previously failed to give good results. The treatment being practically unattended with constitutional disturbance or fever, there is no interference with the customary life and occupation of the patient.

As far as I am able to judge from Klebs' statements, the remedial properties of tuberculocidin reside wholly in its germicidal power, *i. e.*, in its ability to destroy the tubercle bacillus within the human body. He expressly states that no inflammatory process or necrosis of tissue is produced by it.

If Klebs' very positive statements on the above points are borne out by further extended observations, a far-reaching and very brilliant discovery has been given to the world.

In concluding his report Klebs remarks: "That it only remains to determine the limitations which control the cure of the disease produced by the specific bacillus, whose destruction we have succeeded in accomplishing. The first cause may vanish, and yet the pernicious results of the conditions developed from it remain. When advanced destruction of pulmonary tissue has occurred, where the general vitality has greatly depreciated, and emaciation and marked impairment of the heart's function have taken place, cure is no longer to be expected, even with the removal of the first cause of these conditions."

We have now to consider some very interesting and noteworthy investigations of Roemer and Büchner.³⁰ The former, as the result of his experimental researches, has made the surprising announcement that the same reactions can be obtained in tuberculous guinea-pigs from inoculations with proteine containing extracts from the bacillus pyocyaneus (green pus) as with tuberculin. He found that tuberculous animals died quickly after injections of such extracts, while healthy animals lived; that lesions occurred in the liver and spleen of such animals, apparently quite similar, both macroscopical and microscopical, to those described by Koch as due to the specific action of tuberculin. Büchner has corroborated Roemer's observations of the effect of injections of the proteine of the bacillus pyocyaneus, and has found similar effects to follow the use of the proteine of other bacilli, viz., pneumo-bacillus (Friedländer) and the bacillus prodigiosus. Inoculations of healthy men with minute doses of the proteine of the pneumo-bacillus or the pro-

digiosus were followed by redness and swelling at the point of injection and a local rise of temperature, which gradually disappeared, and of quite similar character in the different persons experimented upon. Constitutional symptoms were not produced, Büchner suggests on account of the smallness of the dose administered. The pronounced local reaction, in comparison with that of tuberculin, he believes to indicate a more serious action of the proteine. Büchner concludes his report of his investigations as follows: "Are the proteine extractives of the tubercle bacillus alone capable of exciting a latent irritation to an appreciable inflammation and necrosis? Are not other ordinary exciters of inflammation, especially proteines from harmless kinds of bacteria, possessed of the same power?" The observations reported by him, he thinks, speak favorably for such a possibility, and open, therefore, in a practical manner, new and perhaps not unimportant outlooks.

In the light of extended experimental investigations and of numerous clinical observations, the incorrectness of many of Koch's original hypotheses and conclusions is evident. It has been shown that tuberculin contains not one, but several active principles, respectively capable of producing effects; that whatever remedial action it may possess resides apparently in certain of its albumoses, while its harmful properties are seemingly due to the non-albuminoid substances present in the extract. With the knowledge that tuberculin is the concentrated fluid medium in which the bacilli have been growing, thus presumably containing both the products of their growth and the proteins derived from their bodies, Prudden's experimental studies³¹ of the action of dead tubercle bacilli would seem to be further corroborative of the above views. His experiments indicate that the dead bacilli, freed so far as possible from the products of their growth, are capable of enormously stimulating cell activity and of producing lesions morphologically similar to tubercle, but "which are not indefinitely progressive, and do not tend to the production of an advancing coagulation necrosis, and finally, do not induce an infectious disease."

A legitimate conclusion from these observations would seem to be that the coagulation necrosis, which Koch's hypothesis regards as the remedial mode of action of tuberculin, is dependent upon a metabolic product of the growth of the bacillus.

In view of the remedial effects obtained by Hunter, Cheyne,

and Klebs from the use of a tuberculin presumably freed from metabolic products, and the apparent demonstration by Prudden that a constituent of the protoplasm of the dead bacillus, probably a proteine, is capable of enormously stimulating cell activity, it is justifiable to feel that much light has been thrown on a most complex question.

Whatever beneficial results were obtained from Koch's original tuberculin, I am convinced were not through, but in spite of, a production of coagulation necrosis; and that the benefit claimed to-day by many, from its use in exceedingly small doses, is partly through the avoidance of such an effect. In exceedingly minute doses it is possible that the action of the cell-stimulating proteine preponderates, and thereby a remedial influence is exerted.

A rather large clinical experience, now extending over a period of eighteen months, leads me to reiterate an opinion previously expressed, "that tuberculin contains a remedial principle."

This view is shared, among our own countrymen, by Trudeau and von Ruck, gentlemen who have enjoyed in their sanatoria the widest possible opportunities for thoroughly studying the subject.

In a recent communication by Schede, of Hamburg,³² than whom no Continental surgeon has a larger clinical experience, a similar opinion is expressed. In concluding this portion of my subject I cannot but express my abiding and earnest belief that the continued and exhaustive investigation of Koch's discovery will lead either to such modifications of the original extract, or to the preparation of a new one based upon a similar principle, as will place in our hands an agent specific in character and remedial in tuberculosis in a degree hitherto believed to be unattainable.

The results obtained in the wards of St. Luke's Hospital in the treatment of pulmonary tuberculosis with modifications of tuberculin, already affected, will be appended to the present lecture.

TREATMENT OF PULMONARY AND LARYNGEAL TUBERCULOSIS BY THE CANTHARIDATES.

In February, 1891, Professor Liebreich, in a paper read before the Berlin Medical Society, announced that he had discovered a new remedy for the treatment of tuberculous disease. The property of cantharidin, when taken internally, of producing an exuda-

tion of serum from the capillaries not only of the kidneys, but also of the lungs and other organs, unattended with increased arterial tension, hyperæmia, or extravasation of blood, when used in sufficiently small doses, forms the basis of his theory.

The irritability of the capillaries, according to Liebreich, varies in different parts of the organism in health ; in an abnormal state, such as may be assumed to be their condition at the site of local disease, this irritability is increased. By furthering such irritability by the use of the cantharidates, an exudation of serum occurs which may favorably affect tuberculous tissue in two ways : 1, by stimulating cell activity and nutrition ; 2, through the germicidal action of the serum upon the bacteria.

His experimental investigations apparently indicate in a measure the correctness of his theory. The remedial effects which have followed the use of the cantharidal preparations, while occasionally striking, especially in the case of laryngeal tuberculosis, fall short of securing to them, it seems to me, a permanent place among the therapeutics of tuberculosis.

Their apparent action is in harmony with one of the possible means of a remedial treatment of tuberculosis. Cell activity is stimulated and specifically diseased tissues are subjected to the germicidal action of the blood-serum artificially increased at the site of the disease. There is a failure possibly in the degree rather than in the kind of action. The preparations at present employed are the potassium and sodium catharidates. They are administered hypodermatically at intervals of forty-eight hours or longer, and in doses of $\frac{1}{840}$ to $\frac{1}{320}$ grain. The latter strength not infrequently causes symptoms of vesical and renal distress. Their use is contraindicated in the presence of intestinal and renal disease, and in patients with marked hectic.

TREATMENT WITH THE SERUM OF DOG'S BLOOD.

The interesting experimental investigations of Richet and Hericourt, announced during the past year to the French Academy of Sciences,³³ with the serum of dog's blood in the treatment of tuberculosis, are in the line of thought that at present underlies our attempts to cope with the disease. These observers have been able to demonstrate that in rabbits inoculated with a culture of the tubercle bacillus, the evolution of tuberculosis can be arrested by subsequently subjecting the animal to injections

of dog's serum. When very virulent cultures are employed, the evolution is only delayed. Injections of a healthy animal with the serum prevent the development of experimental tuberculosis at a later period. The effective substance has not been identified as yet, but a small dose of the serum is sufficient (one half cubic centimetre per kilo of the rabbit).

The clinical results obtained in tuberculous disease of human beings by this method of treatment, which has been fully tried in the Paris hospitals, would indicate that it also fails rather in the degree than in the kind of its action. It certainly acts as a potent stimulant to cell activity. Whether it possesses another action is undetermined.

CHLORIDE OF ZINC TREATMENT.

I shall briefly refer to the treatment of tuberculous disease with chloride of zinc injections at the site of the disease, announced to the French Academy of Sciences in July of the past year, by Professor Lannelongue.³⁴

It is based essentially on the simple fact that fibrinous induration is to be regarded as the natural curative process in tuberculous lesions. The power of the chloride of zinc to excite such sclerotic processes, when administered in sufficiently small quantity to avoid its more powerful escharotic action, suggested its use in the disease in question. Its action in experimental tuberculosis is thus described by M. Lannelongue and M. Achard. The anatomical elements of the tissues which it penetrates are destroyed and an enormous proliferation of embryonic cells occurs, not only at the site of the injection but for some distance around it, with infiltration of the tuberculous tissue with migratory cells to the fullest extent. M. Lannelongue suggests that the latter may destroy the bacilli through the exercise of their phagocytic function. The morbid tissue destroyed by the chloride of zinc is slowly absorbed and disappears; the embryonic cells, on the contrary, organize with great rapidity and form firm fibrous tissue, which exists in appreciable quantity as early as the day following the injection.

Twenty-two patients were subjected to this treatment by M. Lannelongue. The list embraces two cases of pulmonary tuberculosis and twenty of suppurating and non-suppurating tuberculous disease of joints and glands. Excellent results are

claimed to have been obtained in a majority of the latter. An opportunity was afforded in a case of more or less fused tuberculous glands for comparing histologically, glands which had been injected and those which had been left without treatment. Excision showed caseous material surrounded by a zone of tuberculous tissue within a fibrous sheath in each ; in the injected glands, however, there was a large amount of dense fibrous tissue and firm adhesion to the investing membrane. A report of the results in the pulmonary cases was reserved until a longer period had elapsed.

While recognizing the possible utility of this method of treatment in tuberculous joint and gland disease, either as a remedial measure or as an adjunct to surgical procedures, and suggesting the desirability of more extended investigations in this direction, its application in pulmonary tuberculosis, in my judgment, should be regarded with the greatest reserve. Aside from the difficulty of introducing intra-pulmonary injections in any exact way at the site of the lesion, the extent and complexity of the morbid conditions usually present would seem to preclude the possibility of its usefulness as a method of treatment.

The technique of the method employed by M. Lannelongue is to inject two drops of a ten per cent. solution, in a number of places around the periphery of the diseased part, in cases of tuberculous joints, bones, and glands. Suppurating glands are thoroughly irrigated with sterilized water, and the injections made under rigid antiseptic precautions. In cases of pulmonary tuberculosis a solution of one in forty is used for the injections.

THE TREATMENT OF TUBERCULOSIS WITH CREASOTE, GUAIACOL, AND CARBONATE OF GUAIACOL.

The literature of the treatment of phthisis pulmonalis with creasote, both by internal administration and by inhalation, is sufficiently familiar to those interested in the subject to warrant the briefest reference to it. Discovered by v. Reichenbach in 1830, it quickly secured a reputation in Germany, France, and England as a remedial agent in pulmonary disease. It, however, gradually fell into disuse, and was only rehabilitated in favor in 1877, through the admirable clinical paper of Bouchard and Gimbert on its beneficial effects in consumption.⁸⁵ Influenced by their statements, Beverley Robinson instituted its systematic

use in his hospital and private practice in this city as early as 1878, and valuable papers by him have appeared from time to time since on this subject.

In Germany a series of publications by Sommerbrodt, Fraentzel, v. Brunn, Guttman, and others, confirmatory of the results obtained by Bouchard and Gimbert, appeared in 1887 and 1888. The literature of the subject at the present time is very voluminous, and it may be said to be exceptionally favorable to the value of creasote in the treatment of pulmonary phthisis.

Varied opinions are held in regard to its mode of action, its most efficient dosage, and the best method of administration. The determination of these several points is of scientific interest as well as of practical import.

The efficacy of creasote in hindering or arresting fermentative processes in the digestive tract, so frequently present in phthiisical patients, and thereby promoting appetite, digestion, and nutrition, is very generally admitted. Its ability to favorably affect appetite and to increase the digestive secretions, when given by the mouth, by locally stimulating the gastric and intestinal nerve-filaments, is also very probable. Through the promotion of a better nutrition, the beneficial effects claimed for creasote, in stimulating the resolution and absorption of the secondary inflammatory exudations in tuberculous lungs, may be explained. By its local action, antiseptic and stimulating, especially when given in the form of inhalations, a favorable influence upon the simple catarrhal processes so commonly present, is conceivable and probable. In turning our attention to any *specific* action which creasote may exercise upon the pathogenic cause of tuberculosis and its specific lesions, the results of experimental investigation properly should be considered.

Guttman,³⁶ as the result of test-tube experiments, which he claimed demonstrated the power of creasote, in solution of 1 to 4,000, to greatly inhibit the growth of tubercle bacilli, and in solutions of 1 to 2,000 to completely devitalize them, was led to believe that a similar specific action could be effected in the human body by the administration of sufficiently large doses of the drug. One gramme of creasote, according to his calculations, present in the circulation would suffice for this purpose. The experimental investigations very kindly undertaken for me by Dr. John Ely in the Pathological Laboratory of the College of Physicians and Surgeons, and which will be given in detail

later, confirm the correctness of Guttman's observations on the germicidal power of creasote.

Granting, therefore, the germicidal action of creasote *outside* of the human body, and also the possibility of administering it without injurious effects in daily doses larger than those demanded by Guttman's hypothesis, a seemingly fatal objection to the theory of the exercise of a germicidal action in the economy, is found in very recent investigations which indicate that creasote enters at once in the blood into chemical combinations with certain contained albuminoids, combinations which are *without specific germicidal influence*. Moreover, it has been wisely said that "man is not a test-tube," and no fact appears to be more clearly proven than that the germicidal action of a drug outside of the body affords little basis for correct conclusions of its therapeutic value. Experiments on animals are necessary to determine these points.

In pursuance of this idea, numerous investigators have attempted to test the anti-bacillary power as well as other effects of creasote in tuberculosis by the treatment of animals with large doses of this drug both before and after the production of experimental tuberculous disease. I shall refer only to the very interesting experiments of Trudeau,³⁷ and Cornet.³⁸

In Trudeau's experiments four rabbits were inoculated in the anterior chamber of the eye and in the right chest with a similar amount of pure cultures of tubercle bacilli suspended in water. Two of the rabbits were kept as "controls." Two were treated every other day with subcutaneous injections of five cubic centimetres of a ten per cent. solution of pure creasote in almond-oil. The course of the eye tuberculosis in the test animals was daily compared with that in the "controls," and was seen to be entirely uninfluenced by the treatment. Tubercles became visible in the iris from the twelfth to the thirteenth day in both sets of animals. Iritis, cloudiness of the cornea, and general secondary inflammatory changes were noted in all the rabbits from the eighteenth to the twenty-first day, and the sight was soon lost. All were killed two months after inoculation, and the lungs of both the test and the control animals presented the lesions of advanced tuberculosis.

Cornet's experiments were as follows: Seven strong guinea-pigs were treated with creasote, introduced into the stomach by means of a tube, in doses equivalent for the body weight of a man to rather more than two grammes daily, for a period vary-

ing from one to two months. At the expiration of this interval they, with four control animals, were either inoculated with or were compelled to inhale finely atomized pure cultures of tubercle bacilli, the creasote treatment being continued in the test-animals. A single test guinea-pig died of pneumonia ten days after inoculation. The remaining six died respectively thirty, thirty-two, thirty-three, forty-three, seventy-seven, and eighty-four days after infection. Two of the control-animals were killed on the thirty-second and forty-third day after infection; the two remaining died on the sixty-first and eighty-fourth day after inoculation. All the animals, both test and control, presented the characteristic lesions of tuberculosis, and very little if any appreciable difference in the appearance, the degree, or the distribution of these could be detected in the two sets.

Experimental investigations, therefore, show in the most positive manner that creasote, administered even in heroic doses, is incapable either of preventing the development of experimental tuberculosis or of arresting its progress.

The theory of Bouchard, Gimbert, Jaccoud, and others, that creasote promotes connective-tissue growth, by means of which recovery in tuberculous disease is favored, also is not borne out by experimental studies in animals.

The explanation of any favorable influence of creasote on sclerotic processes which *clinical* observation may indicate, should seemingly be sought in the improved nutrition which obtains through its use rather than by the exercise of any specific action.

Guaiaicol, obtained by fractional distillation of beechwood-tar creasote, and constituting sixty to ninety per cent. of the latter, was suggested by Sahli,³⁹ as early as 1887, as a substitute for creasote in the treatment of tuberculous disease. It represents the active principle of creasote, and may be substituted appropriately for it. As prepared in the various laboratories, it probably is not freed from all impurities.

Owing to this fact, very lately Seifert and Hoelscher⁴⁰ have proposed the use of the carbonate of guaiacol. Carbonate of guaiacol possesses the advantages over creasote and guaiacol of being a simple, definite, and crystalline substance which can be obtained chemically pure. It is a neutral salt, and is tasteless as well as odorless. It does not produce digestive disturbances, it is indifferent to the gastric secretion, and decomposes in the intestine into guaiacol and carbonic acid.

Many of the above characteristics of this salt have been demonstrated in its use in St. Luke's Hospital. Seifert and Hoelscher, as the result of experimental studies with guaiacol carbonate, have advanced a new and interesting theory of the mode of action of the creasote preparations in tuberculous disease. The basis of their theory apparently rests on the fact that experiments on dogs show that creasote and guaiacol do not circulate in a freestate in the blood, and that they are eliminated by the kidneys in the form of the salts of ethyl sulphuric acid (ätherschwefelsäure). They argue that during absorption, the active principle of creasote allies itself with the albuminoids in the blood, and specifically through the agency of the sulphur contained in the albumin molecule. The blood of tuberculous patients contains in addition to normal albumin other albuminoid substances arising from the disease process, *e. g.*, the products of the tubercle bacillus. These substances constitute unstable combinations, prone to cause or undergo chemical processes, which act poisonously. The toxic albuminoids engendered by the disease are chiefly responsible for the fever, night-sweats, etc. The guaiacol, by allying itself with them, renders them stable and therefore non-toxic. The chemical combinations effected by the guaiacol are *without germicidal influence*, and the favorable results obtained through the use of the creasote preparations in tuberculous disease, therefore, should be regarded as due in a large measure to their influence in assisting in the elimination of the toxic products of the specific disease process.

Seifert's and Hoelscher's theory in no respect militates against other favorable influences which have been ascribed to the creasote preparations, such as the probable direct stimulation of the appetite, and thereby improved nutrition, etc. The observations thus far made in St. Luke's Hospital in the use of guaiacol carbonate, led me to believe that it may be substituted very favorably for both creasote and guaiacol.

INVESTIGATIONS IN ST. LUKE'S HOSPITAL, WITH MODIFIED TUBERCULIN, CREASOTE, GUAIACOL, AND CARBONATE OF GUAIACOL.

During the past winter sixty-five cases of pulmonary tuberculosis have been under my care continuously in the wards of St. Luke's Hospital. Many of these were cases of very advanced disease, without the possibility of recovery, and the treatment

consisted merely in attempts to ameliorate the most distressing symptoms. Nineteen of the remaining cases were selected for treatment, respectively, with Hunter's modifications of Koch's tuberculin, with subcutaneous injections of guaiacol, and with creasote by the mouth. It was my desire not so much to test the comparative merits of different methods of treatment, as to corroborate, or otherwise, Cheyne's and Hunter's observations, and to determine both the practicability of employing a very large daily dosage of creasote, and any advantages this method might possess over its use in smaller quantities. Seven cases of well-marked tuberculosis are embraced in the group treated with Hunter's modified tuberculin. The details of the histories of these patients, and the results of treatment, are given in a tabulated form for convenience in study. It will be seen that three cases have been under treatment for three months, the remainder for nearly two months. Physical examination in two of the former cases indicates no appreciable change in the pulmonary lesions during treatment. In the third case, the improvement in the signs of disease, and in all other respects, has been most marked. Physical examination indicates not only the dryness of the cavity, but also its very evident contraction, as well as a diminution in the degree of the contiguous disease process. In the four remaining cases, there has been no improvement in one; in one, improvement has been marked; in one, it has been distinct, though less marked; and in one case an arrest of the disease, at least temporarily, has occurred. It will be observed in a study of the tabulated report, that by improvement is meant a marked diminution in the physical signs of disease.

Case VII. is certainly an example of arrested phthisis. This is of such rare occurrence in pulmonary tuberculosis of this degree, under conditions which commonly prevail in large city hospitals, as to be particularly noteworthy. A very distinct impression has been made on my mind, in observing from day to day the cases treated with modified tuberculin, that its stimulation of the nutritive processes is not so marked as its effect upon the specific lesions. Creasote, on the other hand, has seemed to me to possess the former quality in a greater degree. To meet possible criticism, all the above cases have received no other treatment than tuberculin, beyond the administration of cod-liver oil, and, from time to time, various ferruginous preparations.

The exact mode of preparation of the modifications used is

given in a note.* The rule of dosage was to give 0.002 gm. for the initial inoculation, and to increase by 0.002 gm. daily. The rule also was made not to increase the dose if any elevation of temperature followed inoculation. With the modifications B. and C.B., appreciable reactions did not occur in the above cases. In a single case not reported in the following table, treated with C.B., a rise of temperature followed an inoculation of 0.008 gm., and an acute catarrhal process was developed at the apex of one lung. At the expiration of the tenth day, defervescence occurred and no further ill effect has followed. For this reason modification B. has been used in all other cases but one. Trudeau has also adopted, I believe, modification B. as the preferable one. Through the absence of all reaction and discomfort attending the use of B., all patients treated with it have been able to be continuously about the wards and out-of-doors. Only the usual very inexact method for determining the number of bacilli in the sputum was used. Repeated examinations were made, and they were found in all.

The number of cases treated with modified tuberculin, while much too small to permit the expression of a positive opinion of its power to exercise a specific remedial action, is large enough to indicate in the strongest manner the desirability of continued investigations of its *apparently specifically beneficial effects*.

My desire to test the practicability of employing a very large

* Method of preparation of Hunter's modifications: Modification "B.," 1 c.c. of tuberculin, 5 c.c. distilled water, saturation with preferably large crystals of ammonium sulphate for twenty-four hours in the cold, the precipitate filtered off and freed so far as possible from any crystals of ammonium sulphate, placed in dialyzer, and dialyzed just so long and no longer in running water, and then in distilled water, until all traces of ammonium sulphate have disappeared. Crystals of thymol added to the solution to prevent any putrefactive change; the solution then made up to such bulk that 10 c.c. shall correspond to each c.c. of tuberculin employed. (Title, B., ten per cent.)

Modification "C.B.," 2 c.c. of tuberculin dropped into 20 c.c. absolute alcohol; heavy precipitate filtered off in a quarter of an hour; filtrate evaporated over water-bath at temperature preferably not exceeding 40 C., and just sufficiently long to drive off all alcohol; residue taken up in 12 c.c. distilled water; placed in dialyzer and dialyzed for two hours in running stream of water. Quantity made up to 20 c.c., including 2 c.c. of pure glycerine used for preservative purposes. A few crystals of thymol added. (Title, C.B., ten per cent.)

The above modifications were prepared for me in the Chemical Laboratory of the College of Physicians and Surgeons.

daily dosage of the creasote preparations, and to determine, if possible, any advantage which this method might possess over their use in smaller quantities, has been fulfilled in a measure. Several of the patients selected for this treatment presented in a well-marked degree many of the symptoms, viz., hectic, sweats, etc., attributed to the toxic influence of the *products* of the bacillus, and were therefore well adapted to test the effect of creasote upon such manifestations. It will be seen in the tabulated record that seven cases have been treated with subcutaneous injections of guaiacol, rapidly pushed to a daily dosage of one gramme, and five cases with creasote by the mouth, also rapidly increased to six grammes daily.

In four of the former cases there has been little, if any, change in the physical signs of disease. In one of these, however, the general condition has greatly improved and there has been a gain in weight of eight pounds. In one, the weight has decreased by one and three quarter pounds; in one, there has been a loss of four pounds; in one, the weight has remained stationary.

In two of these cases the daily sputum has slightly increased in amount; in two, it has slightly diminished. In the three remaining cases, there has been a progressive increase of the pulmonary lesions. No influence upon hectic when present has been observed. Night-sweats, however, have been affected favorably. In a single case suffering from chronic diffuse nephritis (confirmed by autopsy) a marked increase in the albuminuria was observed when a daily dosage of one gramme was reached.

The treatment was then discontinued and the albuminuria gradually diminished. In no other case, treated either with guaiacol or creasote, has any trace of albumen appeared in the urine, in examinations made every other day. In a single case, when the maximum dose of guaiacol was reached, the urine became dark in color and very similar in appearance to urine containing carbolic acid products.

Dr. Ely's report on the enumeration of tubercle bacilli in the daily sputum of several patients treated with guaiacol contains observations of interest and practical import. It indicates the possibility of incorrect conclusions even from the best method at our command for this purpose; also the absence of bacilli, from time to time, in the sputum of patients suffering from grave pulmonary tuberculosis.

In Cases II. and IV., where there has been no apparent in-

crease in the lesions, and the general condition has remained stationary, the number of bacilli has greatly diminished.

In Case VII., in which the area of disease has slightly increased, and the general condition has deteriorated, the bacilli have greatly increased in number.

In the cases treated with creasote there has been no appreciable difference in the physical signs of disease up to the present date, in two. In these there has been a gain of one pound and a loss of three pounds, respectively.

In the three remaining cases there has been a progressive increase of the lesions. The effect of a very large daily dosage of creasote upon hectic and sweats, corresponds to that noted in the use of guaiacol. Entire tolerance of six grammes (over one and one half drachms) of creasote was exhibited by three of the five patients. One complained of slight gastric discomfort when a daily dosage of five grammes was reached, and one patient who had suffered from occasional nausea and vomiting previous to the administration of creasote, believed that these symptoms were increased by it. Several other patients at present in my wards are taking four to six grammes of guaiacol daily, without gastric or intestinal discomfort.

Carbonate of guaiacol has been used, so far as its supply permitted, and aside from the advantage of being tasteless and odorless, and only being decomposed by the intestinal secretions, it has seemed to me to very positively stimulate appetite.

The clinical conclusions which I have formed from a careful study of these cases are : That both creasote and guaiacol in certain forms can be given in very large doses with entire tolerance and without injurious effects ; that such dosage apparently possesses no advantage over a much smaller one, and that it has no greater effect upon hectic and night-sweats ; that subcutaneous injections of the drug possess no advantages over administration by the mouth ; that whatever beneficial influence creasote may exert in pulmonary tuberculosis can be effected with a comparatively small dosage, and that favorable results can be expected only by its continuous and prolonged employment.

Dr. Ely's reports of his investigations on the germicidal action of creasote on the tubercle bacillus outside of the human body, and on the enumeration of bacilli in the daily sputum of patients, treated with guaiacol, are appended.

For valuable assistance rendered me in my investigations, I

desire to express my thanks to Drs. John Ely and Robert J. Devlin, and to the gentlemen of the House Staff of St. Luke's Hospital, Drs. Hollis, Rogers, Bunce, and Tuttle.*

DR. ELY'S REPORT ON THE GERMICIDAL ACTION OF CREASOTE
OUTSIDE OF THE HUMAN BODY.

Shortly after the revival of interest in creasote as a therapeutic agent in tuberculosis the question arose as to the manner in which its beneficial effect was produced. Its general preservative and anti-fermentative properties had long been recognized and made use of in the arts, and the possibility of a similar inhibiting or germicidal action upon the specific germs of tuberculosis at once suggested itself. With a view to the solution of this problem, Guttman undertook a more definite determination of its germicidal action.

In his experiments nutrient gelatine was impregnated with creasote in proportions varying from 1 to 500, to 1 to 8,000. Into this seventeen different species of bacteria, thirteen of them pathogenic, were inoculated, at the same time similarly inoculated tubes of ordinary nutrient gelatine serving as controls. The inhibiting action of the creasote was found to vary considerably with the different species, but in general a creasote content of 1 to 2,000 was found sufficient to prevent growth. The plan of experiment received slight modification in the case of the tubercle bacillus, blood-serum being used as the nutrient medium, and the cultures, after inoculation, being placed in the thermostat at a temperature of 37° C. After several weeks, examination showed a meagre growth in the tubes which had contained creasote in the proportion of 1 to 16,000; none in the others.

Since these experiments of Guttman, so far as I am aware, stand quite alone, it has been thought advisable to repeat them in so far as they relate to the tubercle bacillus, but in slightly modified form. Instead of blood-serum, glycerine-bouillon and glycerine-agar have been used as nutrient media, both of which have shown themselves particularly well adapted to the growth of

* Creasote was administered without exception, in the form of what are known as the "Enteric Pills" of a well-known manufacturer. The nature of their protecting envelope I am ignorant of. Personal investigation of the effect of an artificial gastric juice upon the envelope showed that it was partially dissolved after one hour.

the tubercle bacillus ; and an aqueous solution of guaiacol, the principal ingredient of creasote, has been substituted for the alcoholic solution of creasote employed by Guttman in the preparation of his media.* These media were impregnated with guaiacol in the proportion of 1 to 1,000, 1 to 2,000, 1 to 3,000, and 1 to 4,000, and into them were introduced particles of a rapidly-growing culture of the tubercle bacillus, other media not containing guaiacol, being at the same time inoculated as controls. All were then sealed and placed in the thermostat at 37° C. At the end of seven weeks they were examined and the records tabulated below noted. It may be permissible to state here that every slightest indication of growth was carefully searched for and that no record is made except where all the conditions necessary to the growth of the tubercle bacilli were observed, so that the entry "No growth" in the tables on page 38 means literally what it says.

* Notwithstanding Guttman's statement to the contrary, it was thought possible that the alcohol necessary for the solution of the creasote might have a disturbing influence upon the experiment.

Treatment with Subcutaneous Injections of Hunter's Modified Tuberculin.

No. of Case, Sex, and Age.	Patient's History and Physical Examination at Beginning of Treatment.	Patient's Weight, Daily Sputum, Inoculation Used, Date when Begun.	Duration and Treatment, Weight, and Sputum, to Date.	Physical Examination at Present Date.
I. Male, 42 years.	Profuse hemoptysis 5 years ago; pleurisy 3 years ago; night-sweats and cough since, with loss of 40 lbs. in weight. Physical signs: Slight retraction beneath right clavicle. Evidence of cavity in first interspace; also very abundant largish moist râles at this site. Abundant subcrepitation from first space to base. Posteriorly, same side, abundant subcrepitation, with larger râles, over supraspinous fossa. Abundant subcrepitation over whole of scapular region. Patient apyretic.	Jan. 13, 1892, weight, 134 lbs., Sputum, $\frac{5}{3}$ iv., daily average, "C.B." 0.002 gm., to increase by 0.002 gm. daily.	April 25, 1892, weight, 141 lbs., Sputum, $\frac{5}{3}$ i., daily average, "C.B." 0.198 gm., to increase by 0.002 gm. daily.	April 25th. — Physical signs: Marked retraction, directly beneath right clavicle. Signs of cavity distinctly less marked, and it is apparently nearly dry. Scanty subcrepitation in second space; below this point, no adventitious sounds present. Pos-teriorly, adventitious sounds ab-sent over supraspinous fossa and marked diminution of subcrepi-tation over scapular region. Patient apyretic; no night-sweats. Very marked improve-ment.
II. Male, 47 years.	History of 18 months; sputum occasion-ally tinged with blood; absence of night-sweats. Physical signs: Con-solidation without crepitation over first and second right-spaces and over su-praspinous fossa. Posteriorly, subcrepi-tation over interscapular region. Left lung, feeble respiratory murmur, with scanty subcrepitation beneath clavicle and over supraspinous fossa. Evening temperature occasionally 100 F.	Jan. 14, 1892, weight, 122 lbs., Sputum, $\frac{5}{3}$ j., daily average, "C.B." 0.002 gm., to increase by 0.002 gm. daily.	April 25, 1892, weight, 125 lbs., Sputum, $\frac{5}{3}$ j., daily average, "C.B." 0.092 gm., to increase by 0.002 gm. daily.	April 25th. — Physical signs: Prac-tically the same as on first ex-amination. Evening tempera-ture occasionally 100 F. (on-tion stationary.
III. Female, 32 years.	History of cough and occasional hemor-rhage for past 2 years. Physical signs: Dulness, with rather abundant sub-crepitation in first right interspace; scanty subcrepitation in second space. Dulness, with moderate subcrepita-tion posteriorly, over supraspinous fossa and scapular region. Patient apyretic.	Jan. 17, 1892, weight, 105 lbs., Sputum, $\frac{5}{3}$ j., daily average, "C.B." 0.002 gm., to increase by 0.002 gm. daily.	April 21, 1892, weight, 107 lbs., Sputum, $\frac{5}{3}$ i., daily average, "C.B." 0.176 gm., to increase by 0.002 gm. daily.	April 21st. — Physical signs: Dul-ness with scanty subcrepitation in first space; absent in second. Dulness with scanty subcrepita-tion over supraspinous fossa and scapular region. Little apprecia-ble difference from first examina-tion. Patient apyretic. Con-dition stationary.

IV. Male, 50 years.	Cough for past year; gradual loss of flesh and strength. Physical signs: Impairment of resonance over upper half of left chest, anteriorly, with fairly abundant subcrepitation over same. Posteriorly, impairment of resonance over upper half of left chest, with abundant subcrepitation over supraspinous fossa and scanty in areas over scapular region. Patient apyretic.	March 2, 1892, weight, 144 lbs. Sputum, $\frac{5}{8}$ j., daily average. "B." 0.002 gm., to increase by 0.002 gm. daily.	April 25, 1892, weight, 148½ lbs. Sputum, $\frac{5}{8}$ j., daily average. "B." 0.110 gm., to increase by 0.002 gm. daily.	April 25th.—Physical signs: Little appreciable difference in resonance over upper half of left chest since first examination. Crepitation has almost wholly disappeared anteriorly, and is practically absent posteriorly. Patient apyretic. Marked improvement.
V. Male, 32 years.	Hemorrhage 5 years ago and another 3 years ago, very profuse. Since latter, unable to work, and has lost 40 lbs. in weight. Treated with tuberculin in Presbyterian Hospital a year ago, and apparently improved temporarily. Physical signs: Diffuse infiltration upper lobes of both lungs, with abundant subcrepitation at apices and scantier over remainder of affected regions. Most marked, right apex; occasional night-sweats. Patient apyretic.	March 2, 1892, weight, 123 lbs. Sputum, $\frac{5}{8}$ j., daily average. "B." 0.002 gm., to increase by 0.002 gm. daily.	April 25, 1892, weight, 119 lbs. Sputum, $\frac{5}{8}$ j., daily average. "B." 0.078 gm., to increase by 0.002 gm. daily.	April 25th. Physical signs: No appreciable difference from first examination. Occasional night-sweats. Patient apyretic. Condition stationary.
VI. Male, 33 years.	Cough for 3 months; no hemoptysis, no night-sweats. Physical signs: Impairment of resonance, with loss of vesicular respiration over right infraclavicular region. Abundant subcrepitation in second and third spaces. Similar signs over whole left chest anteriorly; in less degree also over left supraspinous fossa and scapular region. Slight pyrexia; evening temperature, 100.2° F.	March 3, 1892, treatment begun March 21st, weight, 132 lbs. Sputum, $\frac{5}{8}$ ss., daily average. "B." 0.002 gm., to increase by 0.002 gm. daily.	April 25, 1892, weight, 135 lbs. Sputum, none. "B." 0.100 gm., to increase by 0.002 gm. daily.	April 25th.—No appreciable difference in impairment of resonance over affected regions. Subcrepitation scanty at present over right chest, and absent over supraspinous fossa and scapular region, left. Anteriorly, same lung, no appreciable difference from first examination. Patient apyretic since March 18th. Improvement.
VII. Male, 41 years.	Cough for 6 months; no hemoptysis, no night-sweats; gradual loss of flesh. Physical signs: Impairment of resonance, slightly prolonged and high-pitched expiration, with abundant subcrepitation in first two spaces, left; scanty, fine crepitation below. Same signs over supraspinous fossa as beneath clavicle; over upper half scapular region, scanty crepitation after cough. Slight pyrexia; occasional evening temperature, 100° F.	March 3, 1892, weight, 135 lbs. Sputum, $\frac{5}{8}$ ss., daily average. "B." 0.002 gm., to increase by 0.002 gm. daily.	April 18, 1892, weight, 135 lbs. Sputum, none. Discharged, through desire and ability to go to work.	April 25th.—Impairment of resonance over first two spaces. Respiration feeble, but expiration not prolonged or increased in pitch. Entire absence of all adventitious sounds over whole of left chest, anteriorly and posteriorly. Patient continuously apyretic since March 18th. Disease at present arrested.

Treatment with Subcutaneous Injections of Guaiacol Rapidly Increased.

No. of Case, Sex, and Age.	Patient's History and Physical Examination at Beginning of Treatment.	Patient's Weight, Average of Sputum ($\frac{3}{8}$) when Guaiacol m.j. , Increasing m.j. Daily, was Begun; Date.	Duration of Treatment, Weight, and Sputum, to Date.	Physical Examination at Present Date.
I. Female. 17 years.	Cough for 10 months; progressive loss of flesh and strength; no hemoptysis; moderate night-sweats. Physical signs: Excavation at right apex anteriorly, with consolidation below; posteriorly, same lung, consolidation with numerous large râles and abundant subcrepitation over whole of scapular region, below fine crepitation. Left, anteriorly, moderate consolidation at apex, without crepitation. Advanced laryngeal disease. Marked hectic; evening temperature, 102-103 F.	Weight, Feb. 27, 1892, 70½ lbs. Average daily sputum, 3 ss.-3 j. Guaiacol, 0.05 gm. daily, to increase 0.05 gm. daily to 1 gm.	March 20, 1892, 71 lbs. Average daily sputum, 3 j.-3 ij. Guaiacol, 1 gm. reached to-day; discontinued.	March 20th.—Physical signs: Progressive increase of lesions; night-sweats. Marked hectic; evening temperature, 102-103 F.
II. Female. 30 years.	Hemoptysis 3 years ago; present history of cough, 3 months; progressive loss of flesh and strength; no night-sweats. Physical signs: Dulness, prolonged and high-pitched expiration over left infraclavicular region, with very abundant subcrepitation. Same signs posteriorly over upper half of left lung. Right, similar signs, less in degree, anteriorly and posteriorly over upper half. Slight pyrexia; evening temperature 100 F.	Weight, Feb. 27, 1892, 91½ lbs. Average daily sputum 3 j. Guaiacol, 0.05 gm. daily, to increase 0.05 gm. daily to 1 gm.	April 25, 1892, 91½ lbs. Average daily sputum, 5 j.-5 ij. Guaiacol, 1 gm. daily for 37 days.	April 25th.—Physical signs: Little appreciable difference from first examination, except subcrepitation now heard over whole left lung posteriorly. No night-sweats. Slight evening temperature.
III. Female. 24 years.	Pleurisy, right side, 3 years ago. Empyema same side 1 year ago, excision of rib; cough and frequent hemoptysis since; night-sweats. Physical signs: Large antrum in first right space, nearly dry. Moderate consolidation, without crepitation, in second space. Consolidation, apex, same lung, posteriorly, without crepitation. Patient apyretic.	Weight, Feb. 27, 1892, 135 lbs. Average daily sputum, 3 ij.-3 ss. Guaiacol, 0.05 gm. daily, to increase 0.05 gm. daily to 1 gm.	April 25, 1892, 141 lbs. Average daily sputum, 0-½ ss. Guaiacol, 1 gm. daily for 37 days.	April 25th.—Physical signs: Anteriorly, no appreciable difference from first examination; posteriorly, moderate subcrepitation at apex and over upper half of scapular region. Patient apyretic; occasional night-sweats. Marked improvement in general condition.

- IV.
Female.
44 years.
- Pneumonia, 3 years ago; cough since; no hemoptysis, no night-sweats at present. Physical signs: Consolidation, with fairly abundant subcrepitation at both apices. Subcrepitation also present over upper half right scapular and upper third left scapular regions. Slight pyrexia; occasional evening temperature, 100.2° F.
- V.
Female.
32 years.
- Grippe a year ago; cough since; no hemoptysis; profuse night-sweats. Physical signs: Areas of infiltration throughout upper lobe, right lung, with abundant subcrepitation. Areas of infiltration upper lobe, left lung, with abundant subcrepitation and evidence of beginning excavation at apex. Hectic; evening temperature, 101-102° F.
- VI.
Female.
40 years.
- History of 10 months; a single hemoptysis; night-sweats almost continuously. Physical signs: Large antrum, apex left lung, with impaired resonance and abundant subcrepitation to base anteriorly. Posteriorly, areas of subcrepitation to base. Beginning disease at right apex. Hectic; evening temperature, 101-102° F.
- VII.
Male.
31 years.
- Typical history since last November; several hemoptyses; no night-sweats. Physical signs: Feeble respiratory murmur, with abundant subcrepitation over whole of right lung, anteriorly, and upper half of scapular region. Similar signs in slightly less degree over upper lobe left lung, anteriorly and posteriorly. Pyrexia; evening temperature, 101-102° F.
- Weight, Feb. 28, 1892, 90 lbs.; April 25, 1892, 90 lbs. Average daily sputum, 3 ss.-5 j. Guaiacol, 1 gm. daily, to increase 0.05 gm. daily to 1 gm.
- Feb. 28, 1892, 72 lbs. Sputum, 5 ij.-iv., daily average. Guaiacol, 0.05 gm. daily, increasing 0.05 gm. daily. March 12, 1892, 60 gm. Weight, 72 lbs.; sputum, 5 ij.-iv.
- March 15, 1892, guaiacol by mouth, 11 x.; 11 iv. daily average. March 24th, 11 ij. daily in pill, not increasing. April 1, 1892, weight, 64 lbs. April 6, 1892, sputum, 5 iv.-v.
- March 10th.—Progressive increase of lesions. Treatment apparently some effect on night-sweats, none on fever. Died April 1, 1892.
- March 22, 1891, guaiacol carbonate, gr. vj. daily by mouth. April 12, 1892, weight, 86½ lbs. Sputum, 5 iii.; treatment stopped. April 19, 1892, guaiacol pill, 11 vj. daily, increasing, 11 ij. April 25, 11 xxvj.; weight, 88 lbs.; sputum, 5 iii.
- April 25th.—Physical signs: Very similar to those of first examination, except subcrepitation heard over whole of left lung anteriorly and posteriorly; no night-sweats; pyrexia. Evening temperature, 100-101° F. General condition worse.

SERIES A.—*Glycerine-Bouillon. Inoculated March 11, 1892; Examined April 29, 1892.*

Control, Four Flasks.	1 to 1,000, Two Flasks.	1 to 2,000, Two Flasks.	1 to 3,000, Three Flasks.	1 to 4,000, Two Flasks.
1. Moderate growth, not spreading much, but heaping.	1. No growth.	1. No growth.	1. No growth.	1. Apparently slight heaping up, thought to indicate very slow growth.
2. Luxuriant growth, overgrowing whole surface of the bouillon.	2. No growth.	2. No growth.	2. No growth.	2. Slight heaping, though somewhat questionable.
3. Luxuriant growth, overgrowing whole surface of the bouillon.			3. No growth.	
4. Moderate growth, heaping.				

SERIES B.—*Glycerine-Agar. Inoculated March 11, 1892; Examined April 29, 1892.*

Control, Four Tubes.	1 to 1,000, Five Tubes.	1 to 2,000, Five Tubes.	1 to 3,000, Five Tubes.	1 to 4,000, Five Tubes.
1. Very luxuriant growth, heaping and spreading.	1. No growth.	1. No growth.	1. No growth.	1. No growth.
2. Abundant growth, heaping and spreading.	2. No growth.	2. No growth.	2. No growth.	2. Very slight heaping and cloudiness at edges, as if growing sluggishly.
3. Moderate growth.	3. No growth.	3. No growth.	3. No growth.	3. Abundant growth.
4. Moderate growth.	4. No growth.	4. No growth.	4. No growth.	4. Very slight heaping; no apparent spreading.
	5. No growth.	5. No growth.	5. No growth.	5. Slight heaping and cloudiness at edges, as if slowly spreading.

Results of the Determination of the Actual Number of Tubercle Bacilli in Twenty-four Hours' Sputum, by Nuttall's Method.

Case.	Date.	Quantity of Sputum in Twenty-four Hours.	Number of Tubercle Bacilli in Twenty-four Hours' Sputum.
I.	Feb. 24, 1892....	9 fluidrachms ..	227,684,401.
II.	Feb. 24, 1892....	12 fluidrachms ..	7,798,791.
	March 23, 1892..	9 fluidrachms ..	4,189,915.
	April 6, 1892....	1 fluidounce ..	1,946,657.
	April 29, 1892....	3 fluidrachms ..	380,828.
III.	Feb. 22, 1892....	1 fluidrachm ..	579,792.
	March 23, 1892..	3 fluidrachms ..	About one hundred fields carefully gone over without finding any bacillus. Whole drop then examined systematically and still none found. Stain good.
	April 29, 1892....	4 fluidrachms ..	6,858,090.
IV.	Feb. 26, 1892....	6 drachms.....	7,707,033.
	March 23, 1892..	6 drachms.....	274,246.
	April 6, 1892....	4 drachms.....	202,149.
	April 29, 1892....	2 drachms.....	270,228.
VII.	March 17, 1892..	One hundred fields carefully gone over ; no bacillus. Whole drop ; no bacillus. Stain good. A second cover of same examined with same result.
	March 28, 1892..	10 ounces 6 drachms.	One hundred fields searched as above no bacillus. Duplicate cover gives same result.
	April 6, 1892....	11 ounces } 4 drachms }	1,307,395.
	April 29, 1892....	11 ounces	2,915,976.

DR. ELY'S REPORT ON THE ENUMERATION OF BACILLI IN THE DAILY SPUTUM OF PATIENTS TREATED WITH SUBCUTANEOUS INJECTIONS OF GUAIACOL.

While fully recognizing the illusive nature of conclusions as to the value of therapeutic agents based upon periodical determinations of the number of tubercle bacilli in the sputum, it has been thought desirable to make such determinations in a number of the cases treated with creasote and guaiacol.

The method employed for this purpose has been that recommended by Nuttall, the details of which are to be found in the *Bulletin of the Johns Hopkins Hospital*, vol. ii., No. 13, May to June, 1891.

Although this method is unquestionably the most accurate thus far proposed, it is nevertheless subject to great error, and the

results are liable to be particularly misleading in cases in which the amount of expectoration is large and the number of bacilli small. Case VII., tabulated on p. 39, may be referred to as an example. About eleven ounces of sputum were eliminated daily. This was so viscid that its disintegration necessitated the addition of considerably more than an equal bulk of potash and water, so that the total amount after dilution came to be 700 c.c. Since the dropper used delivers about one hundred drops to the cubic centimetre, the content of each drop (in this particular case) must be multiplied by seventy thousand in estimating the total number of bacilli eliminated in twenty-four hours, and, of course, any error in the determination of the number of bacilli to the drop is similarly multiplied. And when there are only a few bacilli to each drop, all may be overlooked in counting fifty fields, or, on the other hand, a disproportionate number may chance to be seen. Thus in Case VII., while the majority of the fields contained no bacilli, one had three. A discrepancy of one hundred thousand or so is a matter of small import when many millions of bacilli are present, but may be very misleading when there are only a few hundred thousand.

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PROCEEDINGS
OF THE
NEW YORK PATHOLOGICAL SOCIETY.

Stated Meeting, January 27, 1892.

DR. H. P. LOOMIS, PRESIDENT, IN THE CHAIR.

DR. FRANCIS DELAFIELD exhibited on a screen a series of

PHOTOMICROGRAPHS SHOWING THE LESIONS OF BRIGHT'S DISEASE.

He said that he had found it convenient to divide Bright's disease as follows: Acute and chronic congestion, acute and chronic degeneration, acute exudative nephritis, acute diffuse nephritis, chronic nephritis with exudation, and chronic nephritis without exudation.

He first exhibited photographs of the normal kidney as a standard of comparison, and then a fine series illustrating the lesions found in the various forms of Bright's disease just enumerated.

At the conclusion of this exhibition, the Society passed a vote of thanks to Dr. Delafield.

DR. J. WEST ROOSEVELT said he wished to direct attention to the fact that Dr. Delafield had made a practical classification of the diseases of the kidneys, which was not only pathologically complete, but, in his opinion, had never been surpassed, as a guide to the clinician in diagnosis, prognosis, and treatment.

DR. JOHN S. ELY presented a specimen from a case of

RUPTURE OF THE LUNG, FOLLOWING PLEURISY WITH EFFUSION.

The patient was a man of intemperate habits, with chronic Bright's disease, who had been admitted to Bellevue Hospital on account of pleurisy with effusion. About fourteen ounces of bloody serum were withdrawn with the aspirator, but the physical signs indicated that the chest contained a much larger quantity of fluid than this, the removal of which was probably prevented by sacculation. Shortly after admission, after sitting up in bed, he suddenly became deeply cyanosed, and fell backward, and at the same time a considerable quantity of fluid was ejected from his nose and mouth. He died almost instantly. At the autopsy, the right pleural cavity was found to contain a large quantity of fluid; the lung was compressed against the vertebral column, and many adhesions caused sacculation of this fluid. At the base of this lung, there was one adhesion which bound the lung quite firmly to the diaphragm, and after removing the lung, and inflating it under water, two ruptures of the lung were discovered in the immediate neighborhood of this adhesion, one, three-quarters, and the other, one-eighth of an inch in diameter.

It had been suggested that these ruptures had been produced by the aspirating needle, but this could be excluded, as the rupture was on the under side of the lung, near the vertebral column, and hence, out of the reach of the needle. Furthermore, the patient died very suddenly more than thirty hours after the introduction of the needle.

DR. ELY also presented a specimen of

GANGRENE OF THE LUNG COMPLICATING PNEUMONIA.

The patient was at first admitted to the hospital as a case of acute alcoholism, but he soon gave evidences of pulmonary consolidation, and the profuse fetid expectoration led to the supposition that there was gangrene of the lung. At the autopsy, one lung was found to be closely adherent to the thoracic wall, and the entire lower lobe was passing from the stage of red to that of gray hepatization. The base of the lung was honeycombed with numerous cavities, which were filled with fetid, greenish material. It was interesting to note that these cavities all possessed a line of demarcation, or a sort of pyogenic membrane, which might in time have led to an isolation of these areas, and possibly to a cure. The gangrene was most noticeable at the

lower and posterior portion of the lung, and this situation seemed to favor the theory of gangrene complicating pneumonia, being due to stasis of the blood, resulting in necrosis. There was no evidence of thrombosis.

DR. WARREN COLEMAN narrated the history of a case of gangrene of the lung, occurring in a 'longshoreman, who had fallen from a height of fourteen feet upon a log. The man continued at his work after the accident for four or five days, and was then seized with severe dyspnœa. He was taken to Bellevue Hospital, where he died about fourteen hours after his admission. The autopsy showed the chest cavity filled with sanious fluid, which had become purulent during the last twenty-four hours of life. The lung was compressed against the spinal column, it was almost completely atelectatic, and was gangrenous in that part of the lung corresponding to that part of the chest which had been struck in his fall. The exterior of the chest showed no lesion at this point, the ribs were not fractured, and the costal pleura was intact. Apparently a pulmonary apoplexy had occurred at the site of the injury, and in the subsequent breaking down had caused the rupture of a bronchus through the pulmonary pleura, for here an opening about the size of a quill was discovered, and on making pressure gangrenous matter oozed through it. He thought the pyo-pneumothorax developed at the time of the sudden appearance of the dyspnœa.

DR. J. M. BYRON exhibited

PURE CULTURES OF THE LEPRO BACILLUS.

These were of peculiar interest, as there had been much doubt as to the existence of pure cultures of this bacillus. The specimens presented represented the fourth generation, and they were made on agar, with glycerine, containing one-half per cent of rock candy, or two per cent. of ordinary sugar. They were obtained about eight months ago from a patient in Charity Hospital. As a means of comparison, he also exhibited tubercle bacilli in the same culture medium. The gray cultures of the lepra bacillus appear at first as very small, star-like, grayish-white spots, so flat and transparent as to be seen with difficulty. At the end of three days, they reach the size of the head of a small pin, and then apparently cease growing; but if cultivated for two or three months in the incubator, they will be found to be slightly larger,

appearing as irregular granular masses, dark in the centre, yellowish at the periphery, with wavy edges. Under the microscope, they bear a close resemblance to tubercle bacilli, except that some of them present a club-shaped extremity, probably due to early involution forms of bacteria, on account of the necessarily prolonged cultivation in the incubator.

AN IMPROVED TURN-TABLE FOR RAPIDLY COLLECTING SEDIMENTS
FROM FLUIDS.

DR. GEORGE C. FREEBORN said that last November, he had presented, in a crude form, an apparatus for this purpose. With it, a speed of 900 revolutions could be obtained, but the machine in its improved form was capable of making 1200 to 1500 revolutions per minute, thus securing more thorough sedimentation.

A LITHOPEDION.

DR. WILSON, of Brooklyn, presented a lithopedion. So far as he knew, no specimen of this kind, had been exhibited in New York since 1865, when one was presented to this Society.

The present specimen was removed from a woman, sixty-six years of age, who died in St. Catherine's Hospital, in uræmic coma, forty-eight hours after her admission. After her death, her friends stated that about thirty years before, while she was in Bavaria, her native country, she was seized with labor pains, which lasted several days, and finally disappeared. She was not delivered of a child, however, although her physician assured her that she was pregnant. The child was never born, and she became the object of much ridicule from her female friends. At the autopsy, the uterus and right ovary were found to be normal, but the left ovary was the seat of a dermoid cyst, about as large as an orange, consisting of a nodular shell, containing fatty material and a small quantity of hair. Situated free in the abdominal cavity, outside of and above the uterus, and in the median line, was an oblong tumor, about twelve inches in length. Its long axis was transverse to the abdominal cavity, and the tumor was adherent to the anterior abdominal wall above the umbilicus by a small calcific plate, about one inch in diameter. The tumor

had no connection with the uterus or ovaries. After enucleating it, it was found to be a fœtus in a state of complete calcification. The head could be seen flexed upon the thorax, and the thighs on the abdomen; the left leg was dislocated at the knee joint, and attached to the mass by a fibrous band; the right shoulder was quite prominent, and the digits on the hands and feet could be plainly seen. The umbilical cord could also be made out. The speaker said that he had not cut into the tumor, but judging from the weight of the mass, and its yielding to pressure, he thought it probably consisted of nothing but adipocire. In one reported case, he believed even the striations of the muscles had been preserved, but in the majority of instances, the interior of the mass was converted into adipocire.

Stated Meeting, February 10, 1892.

DR. H. P. LOOMIS, PRESIDENT, IN THE CHAIR.

DR. LEWIS A. SAYRE presented specimen from

A CASE OF OLD GUN-SHOT WOUND OF THE HIP.

The patient, General Barnum, came to him on January 6th, 1864, stating that he had received a gun-shot wound in the region of the hip, two years before, and that his case was considered hopeless. The patient was tall, thin, and anæmic, but remarkably well built. Examination showed just above Poupert's ligament on the left side, and just inside the anterior superior spinous process of the ilium, an opening through which considerable pus was discharging. The probe not being long enough, a metallic flexible bougie was introduced into this sinus until it detected dead bone. Just then, the end of the bougie sunk into a fissure in the ilium, and not being able to withdraw it easily, it was pushed forward until the end of the bougie could be felt below the posterior superior spine of the ilium, when it was cut down upon, and the end made to protrude. A large quantity of pus escaped from this new opening. There was a cicatrix near this wound, which the patient stated was from an old abscess which had dried up some months before. An eye was made in this protruding end of the bougie, and it was then threaded with

oakum saturated with balsam of Peru, and then it was drawn through the entire canal, thus establishing free drainage. Although this was before the days of antiseptic surgery, this combination of oakum and balsam was really an excellent antiseptic dressing. It was the intention of the operator to pull fresh oakum through every day, cutting off the soiled portion, and he hoped, after a while to be able to heal up the sinuses by a thorough scraping. On the following morning, Dr. Sayre was summoned in great haste to the patient, whom he found suffering great pain. Inquiry showed that the patient had been in such a hurry to get well that he had undertaken to carry out this treatment himself, by twisting on some fresh oakum. He had then forcibly pulled it through, and in doing so, had broken off large pieces of bone, one of which was pressing into the buttock. By a star-shaped incision, and the use of strong forceps, several large pieces of the ilium were removed, the largest of which was an irregular triangle, one inch long, and measuring more than half an inch at its base. This piece was from the wing of the ilium, and showed the external and internal plates, but was, like the other, entirely devoid of periosteum. That evening, the patient left the city for Washington. He returned on September 4, 1865, and called at intervals of a few months, in order to have the drainage kept free. The patient would not consent to giving up his work long enough to enable the parts to be thoroughly curetted. In June, 1874, he came from Chicago in very bad health, as a result of obstruction of the drainage. The wound was enlarged, and a number of small pieces of bone removed, which so straightened the canal as to admit of passing a large perforated drainage tube. For the last two or three years, the drainage had been better, and the discharge scanty. He took cold quite recently and died on January 29, 1892, in the sixtieth year of his age. By the kindness of the attending physicians, Drs. Shrady and Carleton, the speaker had been invited to be present at the autopsy, and the family had permitted the removal of the specimen which he now presented to the Society, before sending it to the Army Medical Museum. On opening the abdomen, some ounces of embalming fluid escaped, but there was no effusion or evidence of recent peritoneal inflammation. The sigmoid flexure of the bowel was firmly united to the peritoneum in the iliac fossa by old adhesions. An incision was made through the left lumbar region at the sacro-iliac junction, and the limb

entirely removed with part of the intestine attached, and with the india-rubber tubes still in the sinuses. On cutting open the intestine, it was found that there had never been any injury to its internal or mucous coat, and that the whole mass was firmly adherent to the ilium at the place where the ball first entered that bone. All the sinuses were healthy except about one inch of their course through the bone, and this diseased tissue could have been easily removed by scraping, and the wound perfectly closed without danger. The entire portion of the ilium removed at his first operation had been more than replaced by perfectly healthy bone, which was nearly two inches in thickness in many places.

Dr. Sayre then read two letters, one from the postmaster of Hillsborough, Ohio,* describing a very similar case, and the other, from Dr. D. P. Chamberlain, the army surgeon who saw General Barnum about twenty minutes after he was shot. He wrote that from a hasty examination, made at the time, he stated that he did not believe there was any immediate danger, notwithstanding the location of the wound, and he based this opinion on the fact that the wounded officer lacked the shock and the peculiar leaden countenance indicative of intestinal perforation. Dr. Sayre said he wished to call particular attention to this statement, as he believed it contained an important aid to a correct prognosis in this class of cases.

DR. C. G. CURRIER presented specimens of

DYSENTERIC ULCERS.

They had been removed from a patient, fifty-eight years of age, and were chiefly interesting on account of the number of these ulcers, which, together with the capillary hemorrhages were found scattered over the colon. The spleen from this patient was also interesting, as at first glance it might be taken for a tuberculous spleen, but closer inspection showed that there was only a thickening of the capsule from a perisplenitis. The heart showed hypertrophy, and the aorta was the seat of atheromatous changes.

A NEEDLE IN THE ABDOMINAL CAVITY.

DR. GEORGE P. BIGGS presented an interesting specimen of a foreign body in the abdominal cavity. It was removed from a woman, sixty years of age, who died of pulmonary tuberculosis

* See *Med. and Surg. Hist. of the War of the Rebellion*, Vol. II., p. 220.

without any symptoms bearing upon the foreign body. Aside from the lesions of tuberculosis, the autopsy showed nothing of interest except a needle, located transversely in Douglas' cul-de-sac. It was $6\frac{1}{2}$ ctm. in length, and $1\frac{1}{2}$ mm. in diameter, and was entirely covered by fibrous adhesions, which practically shut it off from the general abdominal cavity. Only a part of the eye of the needle was left. There was no evidence of any operation having been performed, and there was no uterine disease present. Whether the needle had found its way to this locality from the intestinal canal, or whether it might have been the result of an attempt at abortion, he was unable to say.

DR. J. S. THACHER exhibited a specimen illustrating

A PECULIAR CONDITION OF THE BLOOD OCCASIONALLY
ASSOCIATED WITH DIABETES.

One or two writers had spoken of this as not being very uncommon, but he had never met with it before, and in a series of 37 cases reported at the London Hospital it was not found, and in 43 cases at Guy's Hospital it was only noted twice. Some observers have thought it was produced by a sudden transformation shortly before death, of the excess of sugar into fat, while others have believed it to be caused by acetone in the urine. Still others have claimed that it is not fat, and that the result follows mixing acetone with urine; but the weight of evidence is in favor of its being fat. A microscopical examination of the blood just presented, showed it to be crowded with minute granules, smaller than the smallest micrococci, but on mixing the blood with ether, an emulsion was obtained, which presented under the microscope an appearance similar to that of milk. He had also extracted this substance from the blood with ether, and after the evaporation of the ether there was a greasy residue. It had been suggested that the attacks of coma with impeded respiration, such as we occasionally notice in connection with diabetes, are due to the formation of fat emboli in the lungs, but the evidence seems to point to a different etiology.

This specimen of blood was removed from a girl, about fifteen years of age, in the service of Dr. Beverly Robinson at St. Luke's Hospital. About four or five months before her death, she began to lose flesh and strength, and to suffer from great thirst. During the three months she was in the hospital, the urine contained no albumen, and the daily average of sugar was from four to six per

cent., or from two hundred to two hundred and seventy ounces. She gained in weight slightly immediately after admission, but afterwards lost flesh steadily. The day before her death she was up and around the ward ; about ten hours before death, she was found to be cold, and suffering from labored breathing, and three hours later, after a dose of morphine, she was found asleep, with a pulse of 130, and respirations 16 and very deep. About six hours before death, she was seized with a tonic spasm, which lasted for about ten minutes, and was succeeded by coma, which continued until her death. All the vessels in which any blood was found, contained blood of white color, or of the pinkish hue shown in the specimen. In the heart, there were some reddish coagula, and a quantity of blood looking like coagulated milk. The occurrence of dyspnœa is interesting in connection with this fatty condition of the blood.

DR. A. T. WESTON presented a portion of dura mater showing

RUPTURE OF THE MENINGEAL ARTERY.

The man from whom the specimen was taken was about thirty-nine years of age. At twelve o'clock on the preceding day, he had received a blow on the head from an Indian club. He went home, and feeling sick, went to bed, and, as it was thought, went to sleep. About 3 P.M., when his children returned from school, they found that he could not be awakened. He was then found to be completely comatose, and about two hours later he died in the hospital.

There was no ecchymosis externally, but on removing the calvarium, a large clot was found separating the dura mater from the skull, which measured four inches antero-posteriorly, and about one and a half inches in its thickest part. There was also a linear fracture, about three and a half inches long, extending perpendicularly about one and a half inches in front of the ear. The clot pressed on the brain sufficiently to cause extreme flattening of the convolutions of the left hemisphere. There was also a slight contusion on the right side of the temporo-sphenoidal lobe, from contre-coup. There was no other ruptured vessel. He had seen quite a number of cases of this kind, and in the majority of them there was no fracture, and no injury to the brain except the compression. He thought something might have been done surgically for this case, if the treatment could have been instituted sufficiently early.

Dr. L. A. Sayre concurred in the opinion that if the diagnosis had been made sufficiently early, it would have been a proper case for trephining and removal of the blood clot.

DR. JOSEPH COLLINS presented microscopical specimens illustrating

WEIGERT'S RECENT STAINING FOR THE NERVOUS SYSTEM.

According to this method, nerve fibres were shown with unusual distinctness, and the contrast between the ganglionic cells and their fibres was much better than by Weigert's old method, and the time occupied in the preparing the specimens is much less. The results are also more certain if proper precautions be taken in the staining.

THE PRESIDENT presented a specimen showing

A FIBROID TUMOR COMPLICATING PREGNANCY.

The uterus contained a fœtus of about two and a half months, and a large fibroid tumor involved the right uterine wall and the anterior portion of the uterus. The patient was twenty-eight years of age, and was perfectly well up to two and a half months before admission, when the menses ceased, and she began to suffer from reflex disturbances, especially from pain in the lower portion of the abdomen. At times, she had what she called "a greenish discharge." On admission, examination showed a mass to the right of the uterus. It was decided that the mass was not a fibroid but an extra-uterine pregnancy on account of the reflex disturbance, and many of the symptoms of pregnancy which were present. Laparotomy was performed by Dr. Barrows, and as soon as the mistake was discovered, the uterus was replaced, and morphia given to stop the uterine contractions, but within forty-eight hours the patient died. The cause of death was apparently shock, as there was nothing about the operation wound to suggest any other cause. The specimen illustrated the difficulties in diagnosis presented by this class of cases.

THE PRESIDENT also presented specimens from a case of

SUDDEN DEATH DUE TO FATTY DEGENERATION AND DILATATION OF THE HEART.

On the previous evening, the man was walking along the street in apparent health, when suddenly he fell dead. At the autopsy, no cerebral hemorrhage was found, and no pathological changes

except in the heart, and secondarily in the kidneys. The heart was excessively dilated, and microscopical examination showed that the cardiac walls were the seat of extensive fatty degeneration, hardly any of the muscular fibres having escaped this degenerative change. There were no arterial changes, and no blood clots in the heart. The kidneys showed moderate parenchymatous nephritis. The case was interesting as affording an explanation of many cases of sudden death.

Stated Meeting, February 24, 1892.

DR. H. P. LOOMIS, PRESIDENT, IN THE CHAIR.

MUSICAL HEART MURMURS, AND THE CHORDÆ TENDINEÆ.

DR. H. S. STEARNS said that a little less than three years ago, Dr. E. Hodenpyl had presented to the Society several specimens showing the chordæ tendineæ stretched across the left ventricle, and the question had been raised as to whether they gave rise to any abnormal sound. The specimen which he was about to present showed a similar condition. The specimen had been removed from a man who during life had had a musical systolic murmur at the base of the heart, and transmitted to the vessels of the neck, and also a diastolic murmur at the base, not transmitted into the vessels of the neck.

Dr. J. M. Byron said that the specimen was not only very interesting, but quite rare. He had seen two similar cases, in which the condition had been diagnosticated during life by the musical sound produced during the systole of the heart. In the specimen presented, the inferior chorda tendinea could not have produced the musical murmur, for the heart would have emptied itself before this band would have enough tension to give rise to a musical vibration. The sound may have been produced by the band across the upper part.

The President said that he had followed the case at the bedside very closely. The murmur was peculiarly loud and blowing, and was heard all over the precordial space. It had been supposed to be due to the flapping of an eroded valve. At the time of his admission, the symptoms were those of advanced heart disease. He agreed with the preceding that the sound was produced by the upper chorda tendinea.

Dr. J. S. Ely said that by way of corroboration of what had been said, he would remind the Society that in Dr. Hodenpyl's specimens, the chordæ tendineæ were stretched across the lower or apical portion of the heart, and that in his cases there was no musical murmur.

Dr. STEARNS also presented a specimen showing

THROMBOSIS OF THE MIDDLE CEREBRAL ARTERY.

It had been removed from a man, forty-five years of age, who had been brought to the hospital in an ambulance in a stupid condition, with a temperature of 104° , suffering from intense headache, and unable to speak distinctly. According to his friends, he had been sick for about two weeks, the stupor gradually deepening. After his admission, it was thought possible that he had typhus fever, and he was accordingly isolated. Under moderate doses of quinine, the temperature fell to 101° , and he continued in this same dull condition with all of the general symptoms of pachymeningitis, with the speech symptoms particularly prominent. About four days before his death, he got out of bed, and while walking across the ward, fell in a faint. After this, he was found to have motor paralysis on the right side, sensation was diminished, and was associated with formication. He remained unconscious from this time until his death. The case was seen by a number of physicians, and a diagnosis was made of pachymeningitis with a possibility of a cortical hemorrhage. At the autopsy, the aorta was found moderately atheromatous, the heart was normal, and the left middle cerebral artery contained a thrombus nearly one inch in length and apparently completely occluding the vessel. Nothing was found in the interior of the brain, but in the island of Reil there was a patch of white softening about four-fifths of an inch in diameter. This may not have extended sufficiently deep to account for the motor symptoms, but it was certainly in just the position to explain all the speech symptoms.

Dr. G. C. FREEBORN presented

A SPECIMEN OF POLYPOID SPINDLE-CELLED SARCOMA OF THE UTERUS.

The specimen was removed from a woman, aged fifty-one, married, but never had any children. Twelve years ago one of her

breasts was removed for cancer; a secondary operation being performed in 1889. I have been unable to obtain information of the exact nature of the growth removed.

The specimen presented was in the fresh condition of an irregular pear shape, measuring $5\frac{1}{2}$ cms. in length and 3 cms. in its widest part. On longitudinal section of the mass, it was found to be composed of a central mass mottled white and red and of fairly firm consistency, this was enclosed by a layer of tissue, the capsule of which averaged 2 mm. in thickness.

Microscopical Examination showed the central mass to be made up of moderately large, irregular spindle cells, imbedded in a loose connective-tissue stroma and a large number of thin-walled blood-vessels. The above described capsule was found to be uterine mucous membrane in a state of chronic endometritis. The pedicle of the tumor was a mass of sarcoma.

DR. FREEBORN also presented a specimen of

CYST OF THE OVARY.

The specimens were removed from a woman, age forty-four, married, having had one child. She first noticed a "lump" in the lower part of the abdomen two years ago; this "lump" had not increased in size up to the time of the laparotomy.

The first specimen, the right ovary, shows a cyst measuring 18×17 cms. in circumference, which was filled, in the fresh state, by a clear mucilaginous fluid. The Fallopian tube is firmly attached to the wall of the cyst, its fimbriated extremity being incorporated with it. The surface of the tube and cyst is covered with the remains of numerous thin adhesions. Projecting from the posterior surface of the cyst is a small, ovoid-shaped cyst measuring 22×16 mm. Anterio-posterior section through the mass shows the Fallopian tube, somewhat flattened, firmly adherent to the wall of the cyst and measuring 1 cm. in diameter. The diameters of the cyst are $5 \times 4\frac{3}{4}$ cms., the wall averages 1 mm. in thickness, except at a point just anterior to the tube where an ovoid-shaped corpus luteum increases the thickness to about one half of a centimetre.

Microscopical Examination shows the cyst wall to be composed of fibrous tissue, no trace of ovarian is found except the above described corpus luteum. The Fallopian tube shows hyperplasia with catarrhal salpingitis.

Also a third specimen showing

CYSTIC DEGENERATION OF THE FIMBRIÆ OF THE FALLOPIAN
TUBE.

The specimen, in the fresh condition, showed the ovary to be of an irregular triangular-shaped mass, measuring 27 mm. in length, 23 mm. in width, and 13 mm. in thickness. The surface was deeply corrugated and covered with the remains of thin adhesions. The Fallopian tube measures 6 cms. in length, its outer two-thirds being converted into a thin-walled cyst $4\frac{1}{2}$ cms. long, $3\frac{1}{2}$ cms. wide, and 3 cms. thick, filled with a clear fluid. Longitudinal section through the tube shows the cyst to be composed of a series of small cysts.

Microscopical Examination shows the inner third of the Fallopian tube to be in a state of advanced catarrhal salpingitis; the walls of the cysts are made up of fibrous tissues lined with cuboidal epithelium.

AN IMPROVED METHOD OF STAINING.

DR. J. M. BYRON said that in examining bacteria in tissues and in many fluids, the following method of staining would be found less difficult and more reliable than those usually employed.

For cover-glass preparations, such as sputum, pus, blood, etc., the cover glasses are smeared with the fluid in the usual way, and then directly plunged, without drying, into a solution consisting of one part each of eosin and bichloride of mercury, and alcohol, one hundred parts. They remain in this fluid for about one minute, and are then washed and plunged into a dilute aniline water, *e.g.*, gentian-violet solution, for a minute or two; then in absolute alcohol, xylol, and finally mounted in balsam. Cover-glass preparations of blood are beautifully stained in this way: the red corpuscles, purplish-red; granules and plates, red; and bacteria, a deep blue.

Sections of tissues are first transferred from alcohol to the gentian-violet solution for a few minutes, then placed directly in the solution of eosin and bichloride in alcohol. This sustains everything except the bacteria, and the tissues take the eosin, while the nuclei are stained a light purple. Specimens of gonococci are remarkably well double stained by this method.

DR. WARREN COLEMAN presented a specimen showing

EXTREME ECCENTRIC CARDIAC HYPERTROPHY.

It was removed from a man sixty-one years of age, who up to two years ago had led an active business life. Since then, he had been subject to attacks of vertigo, and had presented most of the symptoms of aortic stenosis and regurgitation, but the gravity of the condition was not appreciated. Only five years ago, he was admitted to a large insurance company. He was a large man, and well nourished. On the night of his death, he got out of bed to get something out of his coat, when he dropped unconscious, and almost immediately died. A physician was hastily summoned, and he performed artificial respiration, as this had succeeded in a similar attack a few weeks before. Death probably resulted from over-distension of the heart.

At the autopsy the pericardium was found very much distended and tightly stretched over the heart, the lungs being pushed backwards and upwards. The left ventricular wall was $1\frac{1}{2}$ inches in thickness, and its cavity somewhat dilated; the heart weighed 28 ounces. The aortic semilunar valves were the seat of a calcareous deposit, varying from one-eighth to one-fourth of an inch in thickness. The valvular orifice was small. The aorta held water imperfectly. The mitral valve admitted three fingers with difficulty. The right heart was perfectly normal with the exception of being of a rather light color, probably due to fatty degeneration.

DR. COLEMAN also presented a specimen of

EPITHELIOMA OF THE RIGHT LABIUM

on account of the comparative rarity of epithelioma in this situation. It was removed from a woman, thirty-six years of age, who gave a specific history. About one year ago she noticed a small pimple on the right labium, which grew slowly until about three months before the operation, when its growth was more rapid. The whole labium was found to be infiltrated, and its inner surface very deeply ulcerated. The specimens which he had placed under the microscope exhibited only one or two epithelial pearls in a series of sections, and at first glance one would consider it a carcinoma, except for a certain regularity of the cells.

DR. COLEMAN presented a third specimen showing

CHRONIC CYSTITIS, AND MULTIPLE ABSCESSSES OF THE KIDNEYS.

There was probably a cystitis followed by an inflammation of the kidneys and the formation of abscesses.

BRONCHIAL CASTS IN FIBRINOUS BRONCHITIS.

DR. COLEMAN also presented gross and microscopical specimens of this condition. The patient from whom they were taken, was a man, sixty-six years of age, who had a good family history, and who had enjoyed excellent health up to the time of this present trouble. Every three or four days he is seized with severe paroxysms of coughing which terminated after several hours by the ejection of these bronchial casts. In the intervals, he did not suffer at all from dyspnœa. He had also an aortic systolic murmur, and some left cardiac hypertrophy, with feeble respiration over the left lung posteriorly, without any change in the percussion note. These bronchial casts are generally found in the young adult female of delicate constitution, and there is very commonly a history of hemorrhages, but this patient gave no such history.

Microscopical Examination showed a central canal, radiating from which were separate portions of tissue which seemed to be made up of more closely interwoven fibres. Some fibres ran longitudinally, and some transversely, and towards the outer portion there were concentric layers apparently indicating that coagulation had taken place gradually. A number of pus cells were found in the meshes of fibrin.

DR. COLEMAN also presented gross and microscopical specimens of

EPITHELIOMA OF THE LARYNX.

According to the history, the thyroid cartilage was involved in the disease, and was considerably ulcerated, and the whole larynx seemed to be filled with the neoplasm. The clinical history certainly pointed towards malignancy. There had been some difference of opinion among those who had examined the growth concerning its nature, some maintaining that it was a carcinoma, while others agreed with him in the diagnosis of epithelioma. Immediately after the removal of the specimen, it had been placed

in ninety-five per cent. alcohol, and on this account it was greatly shrunken. Microscopical examinations had been made of the outer, inner, and middle portions of the growth.

Several members present examined the specimen under the microscope, and expressed the opinion that it was an epithelioma.

ANTHRACOSIS—SMALL PLEURITIC THICKENINGS.

DR. J. S. ELY presented the lungs from a case of lobar pneumonia. They were removed from a man about fifty years of age, who was brought by the ambulance to the Roosevelt Hospital in a condition of extreme collapse, and died almost immediately after admission. The autopsy showed the upper portion of the right lung completely consolidated and in the stage of gray hepatization. The visceral pleura was covered with a thin pellicle of new fibrin, besides some thickened fibrous bands from an old pleurisy. With the exception of these slight adhesions, there were none in either lung. A portion of the left lung was deeply pigmented, apparently from the inhalation of coal dust. In addition to this, in very many places over the surface of the lung, there are small gray spots, one-eighth of an inch or less in diameter, each one of which is surrounded by a small black zone. These spots are slightly irregular in outline, do not seem to be elevated, and are scattered about equally over the upper and lower lobes of both lungs. In the upper lobe of the left lung, there are many grayish spots, which are apparently due merely to a fibrous thickening of the pleura. They might possibly be mistaken for miliary tubercles. A microscopical examination shows them to be small areas of fibrous thickening *in* the pleura, and not in the lung under the pleura. They were usually abundant in this specimen. In many other specimens, they seem to be situated at the points of junction of the lobules.

In 1885, Julius Arnold, of Heidelberg, in an essay on the Inhalation of Dust, considered the small lymphatic structures scattered through the lungs, more particularly at the angles formed by adjacent lobules, very potent factors in causing these deposits of pigment. The speaker had thought these fibrous thickenings of the pleura might be secondary to the deposits of anthracotic pigment, but he had been in some doubt about this since examining them microscopically, as these gray dots, although surrounded by pigment apparently have none within them. The thickenings are probably the result of small areas of inflammation on the pleura,

which by interference with the circulation favor the subsequent deposition of the coal dust.

The President said that he had never seen them except in lungs which were much pigmented. He suggested that they might be secondary to localized inflammations set up by irritating or infectious material brought to the surface of the lungs by the lymphatics.

Dr. Byron asked if these nodules were found to correspond to any lymphatics or capillaries in the tissue. This was a very important point in pathology, and might furnish a clue to the pathogenesis of the lungs. It was not at all uncommon for these nodules to be mistaken for miliary tubercles. That they are not due to the pigment was shown by the fact that the nodules did not contain any pigment. He had made some experiments in connection with the subject under discussion, and he considered it worthy of close study and investigation. Tuberculosis, anthracosis, actinomycosis, leprosy of the lungs, he considered neoplastic infectious diseases, nearly always due to infection through the lymphatics, and that these nodules represented the first stage. He had found them not only on the surface of the pleura, but deep in the lungs.

Dr. Ely said that these were not simply lymph nodules which had undergone interstitial change, for those in the immediate neighborhood remain unchanged. There were no tubercles in this patient.

Stated Meeting, March 23, 1892.

DR. H. P. LOOMIS, PRESIDENT, IN THE CHAIR.

CYSTIC LESIONS OF THE OVARY TUBE.

DR. GEORGE C. FREEBORN presented a large number of specimens illustrating cystic lesions of the ovary and tube. The first series of four specimens were examples of pedunculated cysts of the Fallopian tube, the so-called hydatids of Morgagni. These cysts were quite common, and the pedicles varied considerably in length, those shown in the specimens being mostly of the short variety. The next series consisted of seven specimens of hydrosalpinx, showing the arrangement of the cysts and their appearance at various stages. Then came three specimens of parovarian

cysts, and following these, twelve specimens showing the small follicular cysts found in cases of chronic ovaritis, and six specimens of small retention cysts of the ovary. The next series consisted of six specimens of what are called unilocular cysts of the ovary, in which the ovary is almost entirely converted into a good-sized cyst, so that scarcely any ovarian tissue can be found on microscopical examination. Then followed twelve specimens of multilocular cysts, and three of dermoid cysts. One of the latter was a rare specimen, as the whole cyst wall was calcified. Three papillary cysts were also shown.

Dr. Freeborn called attention to the method which was employed in preparing these cysts, a method which he had described about three years ago.* While in the fresh state, any rent in the cyst is carefully sewed up and a canula tied in, and then the cyst is distended under a pressure of twelve to eighteen inches with Fleming's mixture of chromic and acetic acids. The distended cyst is then immersed in a large quantity of the same fluid for forty-eight hours, when it will usually be found that the cyst wall has become sufficiently firm to preserve the shape of the cyst. This method of preparation is a great aid in studying the configuration of the surface and the various attachments of a cyst.

ŒDEMA AND INFLAMMATION OF THE UMBILICAL CORD.

DR. R. G. FREEMAN presented an umbilical cord which was œdematous, and presented evidence of a localized inflammation about two of the vessels. Labor had come on three weeks before full term, and a foetus of fair size was born dead. The placenta appeared to be normal. The umbilical cord was thinned out at the umbilicus, and was dilated in the middle to 3 ctm. in diameter. Microscopical examination showed an extensive collection of small round cells surrounding the vein, and a small collection around one artery. Most of these cells were in the jelly of Wharton. The condition of the cord, together with the fact that the child was dead before term, indicated a possible tubercular taint, but Dr. Bird, who had delivered the child, was unable to find any evidence of tuberculosis in the family, and there was no definite history of syphilis. Out of one hundred consecutive cases examined in the Sloane Maternity Hospital, only three presented an œdematous condition of the cord, and in these there was not so

* *Proceedings N. Y. Path. Soc.*, 1889, p. 101.

much œdema as in this specimen, and there was no infiltration of small round cells.

Dr. FREEMAN also showed the remains of the allantois in the cord.

REPEATED ATTACKS OF DYSENTERY AND HEPATIC ABSCESS.

DR. G. M. EDEBOHLS presented a specimen from a patient who had had repeated attacks of colitis during a period of six years, each attack being followed by a hepatic abscess, and each abscess being cured by operation, until finally the patient succumbed to the sixth abscess. The patient was a man, forty-three years of age, who was perfectly well up to the summer of 1885. At this time he had a violent attack of dysentery, from which he recovered but slowly. He remained in fairly good health up to May, 1886, when he experienced pain in the epigastrium. When first seen by the speaker in August, 1886, this region was the seat of a tumor, five inches in diameter, which when punctured with an exploring needle yielded pus. On August 31, 1886, an abscess of the right lobe of the liver was opened under cocaine anæsthesia, and 90 gm. of pus evacuated. Adhesions had formed between the liver and the parietal peritoneum. The abscess cavity was irrigated and drained, and after three weeks the tubes were removed, and the cavity quickly healed. He remained well until December of the same year, when a second abscess appeared, about 5 cm., to the right of the former one. The diagnosis was again confirmed by puncture, and the second operation was performed under ether anæsthesia. This abscess was found in the liver substance at a depth of 3 cm., and contained 80 gm. of pus. After draining for three weeks the wound closed, and the patient again enjoyed good health for four years, with the exception of occasional slight attacks of diarrhœa. In August, 1890, he had another severe attack of dysentery, and two or three weeks later began to suffer from pains over the right lobe of the liver, associated with chills and an elevation of temperature as high as 103°. The patient was etherized, and an incision made into the abscess, which was found in the ninth intercostal space, and 8 cm. below the skin level. As the tumor this time was not so prominent as on the previous occasions, the speaker said he was somewhat fearful that there would be no adhesions found, and had accordingly made preparations for a careful laparotomy should this be required. It was fortunate that he did so, for after cutting through

the abdominal walls, he found himself in the general peritoneal cavity. Exploring with the finger, he found that all the organs in the vicinity were normal except for the bulging of the right lobe of the liver. The cicatrices of the former incisions were found, and it was ascertained that the peritoneum directly behind was again free, the adhesions having been absorbed, and their place occupied by normal peritoneum. The surface of the liver was sutured to the parietal peritoneum, and packed with iodoform gauze, and at the end of a week, adhesions having formed, the liver was incised, and a much larger quantity of pus evacuated than at either of the two previous operations. As the symptoms of sepsis continued after this operation, the presence of another abscess was suspected, and as there was some pain on pressure in the eighth intercostal space on the right side posteriorly, a needle was inserted at this point, and another abscess found. This one was opened from behind in the eighth intercostal space. On reaching the pleura, the pleura, diaphragm, parietal peritoneum, and liver, were successively perforated with a Paquelin cautery, and over one pint of pus evacuated. By introducing a pair of uterine dressing-forceps into this abscess cavity, and the finger into the anterior wound, it was ascertained that there was only one inch of normal liver substance intervening. This was perforated with the forceps, and through drainage established. Thinking that some of the abscesses might have been due to the retention of certain substances, it was thought best to keep the cavity open for some time, and to irrigate it daily. On January 26, 1891, about three months after the operation, the drainage tube was removed, and the wound allowed to close. On April 1, 1891, after another attack of acute colitis, another abscess appeared in the left lobe of the liver, and an incision under cocaine anæsthesia evacuated 80 grm. of pus. This abscess was situated at some distance from the surface of the liver, and adhesions had formed, so that no difficulty was experienced in the operation. The patient recovered, and remained well up to March 1, 1892, when he had another severe attack of dysentery, which was followed in two weeks by pain over the right lobe of the liver, and evidence of another abscess. This abscess opened spontaneously beneath the ribs, so that it was only necessary to insert a drainage, and irrigate the cavity. The prolonged entero-colitis had, however, left the patient in a very feeble condition, so that death from exhaustion occurred on March 23d.

The specimen, which had just been removed, showed about one-half of the large intestine, which was the seat of the characteristic lesions of dysentery. The liver showed the fresh abscess cavity, and also the cicatrices indicating where the other abscesses had completely healed. The kidneys were enlarged, and apparently the seat of fatty degeneration.

Each of these attacks of hepatic abscess, Dr. Edebohls said, was preceded by a typical attack of acute colitis, and the pus evacuated at each operation was examined carefully, as was also the subsequent discharges, for echinococci hooklets, but none was found. Unfortunately, no examination had yet been made for the *amœba coli*,* but some of the pus from the last abscess would be subjected to examination for this organism. The case was one of considerable interest, for hepatic abscess is always looked upon as a serious affection, and yet here five operations were successfully performed for this condition, and the patient only succumbed to the sixth abscess, which opened spontaneously. It was also interesting to note that there had been no diminution in the bulk of the liver notwithstanding the large quantities of pus which had been evacuated at various times.

DR. J. S. ELY said that the absence of any diminution in the size of the liver was extremely interesting in view of some recently published experiments made upon animals by Ponfick, who found that considerable portions of the liver could be removed, and yet after a given time, when the animals were examined, it was found that a very considerable new formation of the liver tissue had taken place.

GUN-SHOT WOUND OF THE BRAIN.

DR. J. S. THACHER presented a brain as an illustration of how one bullet might cause two wounds. The specimen had been removed from a patient in the hospital service of Dr. McCosh. The man lived eight days after the injury. The bystanders who saw the shooting said that only one shot was fired, there was only one empty chamber in the revolver, only one hole in the skull, and only one bullet was found. Although there was only a single external wound, situated just above the bridge of the nose, there were two openings through the dura mater, one on each side of the falx, and two cavities, situated symmetrically, one in each frontal lobe, about one inch in transverse diameter, and having

* See page 81.

softened walls. They extended up to the tip of the anterior horn of the lateral ventricle on each side, and contained clotted blood. The bullet was found just inside of the inner plate of the skull. One of the holes may have been made by a splinter of bone.

DR. ELY presented

A VERY RARE MALFORMATION OF THE BLADDER.

The specimen was removed from a man who had presented no bladder symptoms during life. At the autopsy, in cutting through the abdominal wall, the knife cut through the fundus of the bladder, which was found to extend up to within one inch of the umbilicus. The bladder was long and slender, and its walls were of normal thickness, and not all diseased. This malformation of the bladder appeared to be due to a persistence of the urachus. A review of the literature of the subject shows that this malformation is extremely rare. Luschkur described a persistence of the epithelial structure of the urachus, and cysts of the persistent urachus sometimes occur, but he could find no case on record in which the bladder extended upward in this peculiar manner.

DR. ELY also exhibited the bladder of a child at birth, showing how, when distended, it extended up to the umbilicus, and how very short the urachus is at this time.

RUPTURE OF THE KIDNEY OF A CHILD DURING PARTURITION.

DR. J. C. SMITH presented kidneys which had been removed from a child on the day previous. One of these showed a rupture which he believed had occurred during labor. The labor was a difficult one, the child presented by the vertex, and was delivered by the forceps, much difficulty being experienced in the delivery of the hips. The obstruction to delivery was due to a projection forward of the coccyx. The autopsy showed a large extravasation of blood around the kidney behind the peritoneum, with a little bloody serum and coagulated lymph in the peritoneal cavity, and a beginning peritonitis. The child died with symptoms of meningitis, but there was no evidence of this at the autopsy.

THE GROWTH OF VOLUMINOUS CULTURES OF THE TUBERCLE
BACILLUS.

DR. T. M. PRUDDEN said that in his published account of the technique of making tuberculin, Koch describes the method as consisting in floating little scales of the cultures of the tubercle

bacillus on fluid culture media. This is not a new method, as it had been employed by the French for some time, and in this country it had been used for over a year by Trudeau. The tubercle bacilli grow voluminously if *floated* upon an appropriate fluid medium, but the growth is very scanty if the pellicle so formed is allowed to sink to the bottom. He had found that this difficulty could be obviated by introducing sufficient cotton, sterilized by heat, into the vessel, to allow of the scales of the tubercle bacillus resting on the fibres of the cotton.

DR. GEORGE P. BIGGS presented a specimen showing

EXTENSIVE VALVULAR DISEASE OF THE HEART.

The specimen was removed from a girl, thirteen years of age, who had had two attacks of rheumatism, and had complained for some time of marked dyspnœa on slight exertion, and of considerable cough. At the time of her admission to the hospital, there was moderate general anasarca, the cardiac area was decidedly increased, and the apex beat was in the sixth space, four inches to the left of the median line. A presystolic and a systolic murmur were heard just above the apex, the latter being transmitted to the left. At the second intercostal space, to the right of the sternum, a systolic murmur was heard, which was transmitted to the neck, and a diastolic murmur which was transmitted downwards and to the left. The area of the liver was considerably enlarged. At the autopsy, the heart was found to be about the size of a fully developed adult heart, and gave evidence both of hypertrophy and dilatation. The aortic valve showed thickening and retraction; the mitral valve showed very marked stenosis, and the tricuspid valve showed a moderate but distinctly appreciable narrowing of its surface. The pulmonary valves were normal. The only other lesions were those due to chronic congestion of the various organs.

DR. GEORGE P. BIGGS also presented a specimen showing

DILATATION AND EXTENSIVE ATHEROMA OF THE AORTA.

The heart had been removed from an adult, forty-four years of age, in whom death had resulted from a pericarditis and a pleurisy following a septic condition connected with disease of the urinary passages. The aorta showed very extensive atheroma throughout its whole extent, with calcareous deposits in places,

and at its origin just above the valve, there was a distinct dilatation, 5 ctm. in diameter, with calcification of its walls. The valves were normal, except a marked thickening of the bodies in the centre, which apparently compensated for the relaxation of the valve at the base. There was no deposit of fibrin.

THE PRESIDENT presented

A CYST GROWING FROM THE HILUM OF THE SPLEEN.

The patient from whom the specimen was obtained was a woman, forty-six years of age, who died after an eight months' illness from cancer of the liver. The condition of the spleen was not suspected during life. Closely adherent to and apparently growing from the hilum of the spleen was a single large cyst, about five inches in diameter, and containing twenty ounces of a whitish, amber-colored, and slightly viscid fluid, rich in albumen. The wall of the cyst was an eighth of an inch in thickness, and from its inner surface projected several smaller cysts about the size of walnuts. These latter contained a brownish fluid, and microscopical examination showed the fluid contained cylindrical epithelial cells, fatty corpuscles, Drysdale cells, red blood-corpuscles, and granular material. The interior of the wall of all the cysts was comparatively smooth and lined with cylindrical epithelium. In appearance, structure, and the character of the contents this cyst resembles an ovarian cyst.

Dr. Freeborn considered the specimen to be an ovarian cyst. It was probable that there had been some peritoneal inflammation and contraction by which the cyst had been lifted out of the pelvic cavity, and then adhesions had formed between the cyst and the spleen.

Stated Meeting, April 13, 1892.

DR. H. P. LOOMIS, President, IN THE CHAIR.

DR. GEORGE P. BIGGS presented the lungs from a man who had been admitted to the cells of Bellevue Hospital with delirium tremens, associated with a very high temperature, and signs of pulmonary consolidation of the lower lobes. The temperature

reached 106° before death. The autopsy showed consolidation of both lower lobes of the lungs, having a somewhat lobular form, and a peculiar degenerated cheesy appearance. Microscopical examination seemed to point to a lobular pneumonia. At the apex of one lung was a small cavity, about 1 cm. in diameter, surrounded by a pigmented fibrous area of considerable extent. Scrapings from the surface of the consolidated portions were examined, and found to contain large numbers of tubercle bacilli.

Dr. W. P. Northrup said that the uniform distribution of the light spots seen in the specimen were very much like those so frequently seen in the broncho-pneumonia of children. From their distribution and general appearance, he was inclined to think that the specimen showed a broncho-pneumonia with infiltration of the bronchioles.

ACUTE YELLOW ATROPHY OF THE LIVER.

Dr. BIGGS also presented gross and microscopical specimens from a case of acute yellow atrophy of the liver.

The patient was a young woman, twenty-one years of age, who was admitted about 1 A.M. on April 8th., in a fairly rational condition, but unable to give a trustworthy history of her illness. She was found to be markedly jaundiced, the pulse was about 50, and the temperature 97° . Physical examination showed the pelvic organs, and in fact all the other organs normal excepting the liver, which was diminished in size. The jaundice became very intense, and she had frequent tonic spasms of the upper extremities, and almost constant movements of the lower extremities, but not of a spasmodic or convulsive character. She passed gradually into a low form of delirium, then into a stupor, and finally into coma. The pulse remained slow until just before death, when it ran up to 130, and the temperature continued to be subnormal until just before death, when it suddenly rose to 105° . The only special point of interest at the autopsy was the liver, which was markedly diminished in size, and weighed only thirty ounces. It was very soft, and intensely congested, with the exception of a few slightly depressed areas, which were of a reddish color. Microscopical examination showed that there was an almost entire absence of liver cells, and very extensive fatty degeneration, which was also present in the other organs.

RUPTURE OF AN ANEURISM OF THE ABDOMINAL AORTA INTO THE
PSOAS MUSCLE.

DR. J. S. THACHER presented a specimen of this kind. The patient entered St. Luke's Hospital complaining of pain in the left side of the abdomen, and examination showed a tumor in the left lumbar and iliac regions, the nature of which could not be determined. Exploratory laparotomy was performed, and a pulsating tumor found in the iliac region. The patient died shortly afterwards from acute peritonitis. The autopsy showed an aneurism pressing upon the first and second lumbar vertebræ, whose bodies it had eroded. Behind and to the right was an opening into the aorta, about one and a half inches in diameter. The left side of the aneurism had ruptured into the psoas muscle, and had extended inside of this muscle to a point about half an inch below Poupart's ligament. It had formed quite a large cavity in the muscle, which was found filled with blood clots.

DR. H. I. BOLDT presented a specimen of

SARCOMA OF THE KIDNEY.

It had been removed from a woman, thirty-six years of age, a patient of Dr. Burke, who had presented herself to the speaker on January 4th, complaining of a pain in the lower and right-hand portion of the abdomen, which had existed for about one year. She had had three normal labors. Examination showed a tumor, most prominent to the right of, and a little below, the umbilicus, and independent of the pelvic contents. A solid tumor of the right kidney was diagnosticated, and three days later the tumor was removed without difficulty by abdominal section. According to his invariable custom, the pedicle was tied with catgut. The peritoneum was closed over the cavity by a running catgut suture, no drainage being used. The other kidney appeared to be normal. The abdomen was then entirely closed, and the patient made a good recovery.

DR. BOLDT also presented a specimen of

LARGE HYDRONEPHROTIC KIDNEY,

which had been removed from a patient of Dr. Vandegrift, aged twenty-one. This patient began to menstruate when twelve years of age, the flow being regular and normal in quantity, but for the past seven years it had been preceded and accompanied by severe

pain in the right ovarian region, which was also present in the inter-menstrual period, but was not so severe. Quite recently, also, there had also been pain in the right lumbar region. The bowels were constipated, and micturition frequent. She was poorly nourished, had a rapid, small pulse, and slight fever. Examination showed a tumor sensitive to touch, freely movable, and extending above the umbilicus, and it was thought to be an ovarian cystoma with a long pedicle, until an examination under anæsthesia, just prior to the operation, showed that it was independent of the ovary, and that it was probably a tumor of the kidney. Abdominal section confirmed this diagnosis, and showed so much destruction of this kidney, without any apparent involvement of the other kidney, that it was deemed advisable to remove this one rather than to simply drain it. The pedicle was accordingly tied with catgut, and drainage established through the loin, and the peritoneum closed over the sac, and the abdominal wound closed. With the exception of periodical elevations of temperature, which yielded promptly to the administration of quinine, the patient made an uninterrupted recovery.

DR. BOLDT also presented two specimens of

OVARIAN CYSTOMA

in which the condition had been mistaken for pregnancy. One was a fibro-cystic tumor of the ovary, and the other an ordinary ovarian cystoma. Fibro-cystic tumors of the ovary are comparatively rare.

REMOVAL OF A TUMOR OF THE KIDNEY FROM A CHILD TWO YEARS OLD.

DR. L. EMMETT HOLT presented a tumor of the kidney which had been removed from a child two years old. It had not been as yet examined microscopically, but was probably a sarcoma. The patient had been under observation only three weeks prior to the operation, and the only history obtainable was that the swelling had first been noticed in the right side of the abdomen about six months before, appearing first in the region of the loin, and growing slowly. There had been no pain or difficulty in micturition, and no such symptoms were observed after admission. The urine was repeatedly examined, but with negative result. There was only moderate cachexia. The tumor occupied

the greater part of the abdominal cavity, extending in the hypogastric region nearly over to the left spine of the ilium, and crowding the liver up into the hypochondriac region ; it occupied almost all of the right side of the abdomen, was elastic to the feel, and had a distinct sulcus in its centre, which gave rise to some difference in opinion as to whether it was cystic or solid. The tumor was removed yesterday by Dr. Abbe, through a lumbar incision. The operation lasted forty-five minutes, there was very little blood lost, and the operation was followed by very little shock. At the present time the child is doing exceedingly well. About nineteen out of every twenty children operated for such tumors die within a few hours after the operation from shock. It had not been necessary to exsect any ribs in order to remove the tumor. The tumor weighs two and a quarter pounds, and appears to have originated from the outer and anterior aspect of the kidney. The ureter was patulous throughout.

Dr. Boldt said that some time ago in removing a much larger tumor of the kidney from an adult, he had been compelled to resect two ribs before he could enucleate the tumor.

A SAFETY-PIN IMPACTED IN THE ŒSOPHAGUS.

Dr. HOLT presented a specimen from such a case. It had been removed from a child, nine and a half months old, who had been under observation for a rather protracted pneumonia, to which it finally succumbed. At the autopsy, a safety-pin of small size was found impacted in the œsophagus about half an inch from the cardiac orifice, the shaft of the pin lying along the œsophagus. It had produced an ulceration of the œsophagus, and a certain amount of cellulitis. The pin was not corroded, it was lying open with the hinge end downward in the position in which it was swallowed. As the ulceration was very superficial, it is probable that it had not been there more than ten days. There had been no symptoms referable to this foreign body, except that about ten days before death, there was quite marked dyspnœa for a day or two with no obvious cause. This disappeared spontaneously, but returned about eight hours before death, and continued until death. As the autopsy showed well-marked catarrhal laryngitis, this may have been the cause of the dyspnœa. The child was able to drink well from its bottle up to within eight hours of death.

Stated Meeting, April 27, 1892.

DR. H. P. LOOMIS, PRESIDENT, IN THE CHAIR.

THE DIAGNOSIS OF TUMORS OF THE BLADDER BY MICROSCOPICAL EXAMINATIONS.

DR. F. FERGUSON presented a series of specimens illustrating the different varieties of tumors of the bladder, their situation, and general characteristics, and dwelt particularly on the important aid in diagnosis rendered by microscopical examinations. Exclusive of the cystoscope, he believed that the best method of making a diagnosis of tumors of the bladder was by continuous microscopical examination of the urine. This method of diagnosis is of comparatively recent date. The method which he adopted, consisted in collecting the entire quantity of urine voided during the twenty-four hours, and collecting the sediment from this by filtration through cheesecloth. Small fragments of tissue which are found in this sediment, are hardened in alcohol, imbedded in celluloidin, and one or two hundred sections made and examined with a low power. If this preliminary examination reveals anything of importance, the sections are stained and examined with higher powers. In some cases, a sufficient number of fragments may be obtained from a small quantity of urine, and may not require to be examined for several days at a time. The present method of removing a small quantity of urine with a pipette and examining one or two slides is very unsatisfactory, but by making repeated examinations of a large number of sections of tissue, much more valuable information can be obtained, and the speaker thought a more general adoption of this mode of examination would soon greatly enlarge our knowledge of tumors of the bladder. By this method, he had made the diagnosis on several occasions, and had had the satisfaction of having its accuracy confirmed by subsequent operation.

Tumors of the bladder had, up to quite recently, been considered to be comparatively infrequent, and this was chiefly owing to the fact that at post-mortem examinations, the bladder is seldom subjected to the same careful examination as were the other parts of the body.

Dr. H. J. Boldt asked how long the diagnosis of these growths had been made in this way, for he knew that Dr. Heitzmann had been engaged in such work for a number of years. He would also like to know what precautions were taken to prevent the decom-

position of the urine while the total quantity for the twenty-four hours was being collected.

Dr. Ferguson said that he supposed such examinations had been made only during the past twenty years, and then chiefly by German pathologists, who had reported occasional isolated cases. When speaking of the comparative newness of this method, he had referred particularly to the examination of small fragments, and the importance of making such examinations systematically. No special precautions were necessary to preserve the urine for twenty-four hours, as during this time it was not likely to undergo much change, and as the specific gravity of tumors was much greater than that of the urine—1035 to 1045—the fragments sunk to the bottom quickly, and were therefore quite easily collected.

Dr. Samuel Alexander said that he had been deeply interested in the paper, because he knew of no department of genito-urinary surgery where there is more need of such a contribution than in the pathology of tumors of the bladder, and previous writers had made very vague and confusing statements. He agreed with the author that this lack of accurate knowledge was due chiefly to the want of attention paid to the condition of the bladder at autopsies. It was certainly not to the credit of the profession that tumors of the bladder could grow to the size of those presented, before any accurate diagnosis was made. Professor Guyon, in a paper read before the French Congress two or three years ago, said that it was the greater duration and persistence of the hemorrhage, in spite of rest and position, which was distinctive of tumor of the bladder; but such hemorrhages are also present in the so-called primary tubercle of the bladder, and in certain forms of chronic cystitis. Sufficient attention had not been called to the fact that operations were sometimes performed for supposed neoplasms in the bladder, when in reality, the hemorrhage was due to certain fungous growths from the mucous membrane. Professor Guyon asks if these represent an early stage of villous growths, or if they are simply the result of inflammation, or due to the destruction of the mucous membrane in places, causing this appearance of villousities. The speaker said that the presence of vessels and cylindrical epithelial cells would seem to indicate that they are true villous growths.

The method described in the paper for the microscopical examination of the debris is most excellent, but it would require long experience and close study before such examinations would yield

us thoroughly trustworthy results. For instance, if the portions examined are from villous growths, nothing could be affirmed concerning the character of the tumor, as these growths often spring from the surface of other tumors. He had met with two cases where there were a number of such small growths, and microscopical examination made after the death of these patients showed a carcinomatous deposit in the bladder wall which had not been observed even after the most careful examination. If a tumor be limited to the posterior wall of the bladder, by placing the patient on the back, and completely emptying the bladder, one can with one finger in the rectum, and the other over the pubes, outline the position of the tumor, much better than can be done with a searcher and with fluid in the bladder.

He would like to ask the author, which variety of tumor he had found most common, and in what proportion of cases does the growth involve the mucous structure of the bladder.

D. Ferguson said that he had found the papilloma most frequently, although it was not uncommon to find a papilloma mixed in with some other variety. He could not give the exact proportion of cases in which the muscular structure was involved, but he thought they were very few.

DR. ELIZABETH N. CUSHIER presented a specimen of

MALIGNANT ADENOMA OF THE UTERUS,

which had been removed from a patient, fifty-six years of age, who had passed the menopause about eight years. The first symptoms of the disease were noticed about nine months ago, at which time there were slight hemorrhages from the uterus, and some pain referred to the right side. Last fall, the symptoms becoming more severe, she was sent to the Infirmary, when portions of tissue were removed with the curette, and submitted to Dr. J. S. Ely, who reported that the disease was a malignant adenoma. The uterus when removed one or two weeks later, showed on section, but slight involvement of the mucous membrane, no fungosities except in one small spot, and a small mucous polypus near this point, in addition to the adenoma which formed a circumscribed mass about the size of a bean. It was not until a section had been removed from the uterus, that the whole organ was found to be extensively diseased.

Dr. J. S. Ely said that the intention in calling this "malignant" adenoma was to distinguish it from adenomatous hyperplasia, a

hyperplasia of all the elements of the mucous membrane, but not involving the deeper tissues.

DR. GEORGE P. BIGGS presented specimens illustrating

INTERSTITIAL MYOCARDITIS.

The specimen was from a man, sixty-two years of age, who was admitted to the New York Hospital on March 5, 1892. He gave a history of previous specific and malarial infection, and of intemperance, but the family history was negative. For three weeks he had been in bed suffering from marked dyspnœa and marked prostration, associated with cough and bloody expectoration. On admission his pulse was 120, respiration 40, and temperature 97°, and physical examination showed moist râles over both sides of the chest; cardiac sounds very feeble; no murmurs. The first sound was heard most distinctly in the fifth space, six inches to the left of the median line, and the heart action was rapid but regular. There was moderate general anasarca. Examination of the urine showed it to have a specific gravity of 1020, and to contain a trace of albumen, with hyaline casts. The expectoration continued to be bloody. He died on May 10th, and the autopsy showed general subcutaneous œdema, and fluid in all the serous cavities. The heart was about twice its normal size, and its valves were all normal. The cavity of the left ventricle was dilated; the left wall was $2\frac{1}{4}$ ctm., and the anterior wall $\frac{3}{4}$ ctm. in thickness. This marked diminution in the thickness of the anterior wall was due to very extensive so-called "interstitial myocarditis," which was also seen in the left half of the interventricular septum. The muscular substance had been almost entirely replaced by dense fibrous tissues, and attached to the surface were numerous firm thrombi. The marked hypertrophy of the uninvolved portion, the speaker considered to be due to the extra work thrown upon it by the very great loss of power in the affected portion. The remaining cavities of the heart were all moderately hypertrophied and dilated. In the right auricular appendix was a soft thrombus. In the left coronary artery, two centimetres from its origin, there was extensive calcification over an area $1\frac{1}{2}$ ctm. in length. On opening the vessel, a thrombus was also found at this point, producing complete occlusion of the vessel. The specimen showed very clearly the primary degenerative nature of the lesion known as "interstitial myocarditis." The lungs contained numerous

hemorrhagic infarctions of recent formation. The other organs showed only the lesions of chronic venous congestion.

The President remarked that Sir William Gull had just written an article in which he claims that plugging of the coronary artery by a thrombus produces interstitial myocarditis, while plugging of the small branches of the coronary artery, as would occur in fibrous thickenings, always produces fatty changes in the heart.

DR. F. TILDEN BROWN presented a patient, and exhibited microscopical slides illustrative of

TUBERCULOSIS OF THE GENITO-URINARY TRACT.

The tubercle bacilli were so numerous as to form almost a pure culture. The patient, a sailor, while on shipboard, and poorly nourished, first noticed a very slight hæmaturia, which disappeared after a time. About one year ago it again became troublesome, and he went to the Marine Hospital and was examined with the cystoscope, but he states that, for some reason, the examination was unsatisfactory. The hæmaturia was not relieved. He first came under the speaker's care about two weeks ago, and was then passing small blood clots. Rectal examination showed slight enlargement of the lateral lobes of the prostate, and two tender nodules near the apex of the seminal vesicles. There was apparently no disease of the lungs, but the patient's voice was a little husky.

DR. BROWN also exhibited specimens and drawings of

A SUPPOSED NEMATODE PARASITIC WORM FROM THE URETHRA.

The patient, a man forty-eight years of age, a native of this city, who has never lived in the tropics, has had a urethral discharge for seventeen years. He has only had gonorrhœa once, about three years before this discharge began. Last summer, the patient was referred to the speaker by Dr. Brewer, and a speculum examination showed nothing except a ragged appearance of the mucous membrane of the urethra from the membranous portion to the meatus, with some œdema, and an unusual prominence of the papillæ. When this examination was made before urination, white muco-purulent secretion was seen, and this was particularly abundant in the bulbar urethra. Various methods of treatment were tried during the next two months, but without benefit. Treatment was then discontinued for seven months.

DR. E. D. FISHER presented a brain showing

ATROPHY OF ONE HEMISPHERE.

The specimen had been removed from a person, seventeen years of age, who had had cerebral hemiplegia in childhood, probably at birth. The patient presented the usual condition—hemiplegia, marked contractures, non-development of the bones of the upper and lower extremities, exaggerated reflexes, imbecility, and epilepsy, and the speech was limited to a few simple words. The side of the brain opposite the paralysis of the body was very much atrophied, and the convolutions were so much shrunk that it seemed almost as if this portion of the brain had been subjected to the contracting action of nitric acid; the cortex was at least one fifth thinner than that of the opposite side, and the ventricle on that side was very much dilated, and filled with fluid. The hemisphere of the cerebellum on the opposite side was also considerably atrophied, and there was degeneration extending from the cortex through the internal capsule and pons down to the cord. No microscopical examination had yet been made.

The chief point of interest was in regard to the cause of this condition: was it the result of an injury at birth, or was it due to a meningeal hemorrhage? The person was, of course, too old to furnish evidence of any hemorrhage; there was nothing in the condition of the vessels to indicate any intra-cerebral trouble, so that the condition must have been due to either a meningeal hemorrhage or to an encephalitis. It was another one of those cases showing the futility of any operation for the relief of such a condition, unless undertaken in the second or third year of life, and even at this time it was extremely likely to prove fatal.

DR. J. S. THACHER presented a specimen showing

MINUTE HEMORRHAGES IN THE BRAIN,

the result of a blow on the head. The specimen was removed from a person who had fallen from a high scaffold. It was not uncommon to find such hemorrhages after a severe blow on the head, and he thought he had seen them also in cases of apparent concussion of the brain. In one case he recalled there were first symptoms of concussion, then deepening coma, and death, and only these minute hemorrhages were found.

DR. H. J. BOLDT presented a specimen of

RUPTURED TUBAL PREGNANCY,

which had been removed from a woman who had previously given birth to several living children. For the past four or five years she had been treated for right salpingitis. She went three weeks past her menstrual period, and was then seized with griping pain in the right ovarian region, accompanied by a slight discharge of blood. When examined by the speaker on the day previous to the operation, the uterus was found posterior, and the intraperitoneal hæmatocele, instead of being retro-uterine, as is usual in these cases, was ante-uterine. The operation was difficult, but the patient is doing well.

In answer to the question, "why was not this a case of hæmatoma?" Dr. Boldt replied, because if it were a hæmatoma there would not be such a history, which was very characteristic of tubal pregnancy. The peculiar dark chocolate-colored blood which was discharged from the uterus, he had never seen except in connection with a tubal gestation. Besides this, the villi could be seen in the specimen.

DR. BOLDT also presented a specimen of

INTERSTITIAL AND SUBMUCOUS FIBRO-MYOMA OF THE UTERUS,

which he had successfully removed by abdominal hysterectomy. Menstruation had been becoming more and more painful and profuse for the past eight years, so that at the time of the operation, March 6th, the flow recurred at intervals of a little over a week, and lasted for ten or twelve days. She was thirty-two years of age, had been married ten years, and had never been pregnant. The menstrual pain was unbearable, and required the free use of narcotics. She was treated for four months with galvanic currents of from fifty to one hundred milliampères, and was given internally the fluid extract of hydrastis, and although the bleeding became less profuse the pain was not relieved. At the operation, after tying off the structures on either side, the bladder was separated, after first distending it partially with fluid to show its attachments more clearly. In this way injury during the operation is avoided. This method was suggested by Dr. Mackenrodt, the first assistant of Dr. A. Martin. Under the guidance of a finger the vagina was then pierced posteriorly from above, and sutures passed all around the cervix. The

stumps of the broad ligaments were then stitched to the vagina, and the peritoneum closed over the wound. The cervix was also removed.

The speaker said that in 1889 he had first removed the entire uterus for myoma, and although at that time he had used a somewhat different method, the principle of removing the cervix also, in order to avoid the liability of sepsis, was the same. In November of the same year he had first publicly commended this method of complete removal where the condition seemed to demand a hysterectomy, but where the patient's condition rendered this operation very dangerous it should not be forgotten that supra-pubic amputation can be done more quickly and safely.

ABSCCESS OF THE LIVER—DEATH FROM SEPTICÆMIA.

DR. R. W. GREENE said that one year ago last June he was called to see a woman, forty-nine years old, who was suffering from severe colicky pains in the left side, just below the free border of the ribs. The fæces were clay-colored, but there was no jaundice. On March 17, 1891, she had another such attack, and this time there was deep jaundice within the first twenty-four hours, and clay-colored stools. After a few days a tumor appeared beneath the surface of the liver, to the right of and above the umbilicus, and separated from the liver by the tympanic resonance of the transverse colon. It increased in size, and on April 8th an aspirating needle withdrew a very peculiar-smelling pus. On the following day $1\frac{1}{2}$ pints of this pus were evacuated, and the patient made a good recovery. She recovered quickly also from a third attack of jaundice and pain, which occurred last January, but in the latter part of February she began to have severe chills, and an irregular temperature, reaching at times to 106° . It was then noticed that the sinus leading from the abscess had closed deeply. There were no tender spots, and no pain, and the liver was apparently not enlarged. On April 18th she died, and a partial autopsy was permitted. The apex of the gall-bladder was found adherent to the small intestine, and at this point there was a perforation between the two; the gall-bladder was very much thickened, and contained rather thick pus. Following down the common duct and the gall ducts, these were found to be greatly distended with the same material. Infection must have come from the communication between the gall-bladder and the intestine, the abscess being entirely confined to the gall

ducts. Two or three small pieces of stone were voided through the sinus, and a piece of stone was found at the point of perforation.

ABSCCESS OF THE LUNG—A MALFORMATION OF THE STOMACH.

DR. J. S. ELY presented specimens which had just been removed from a man, thirty-six years of age, who had been admitted to the Roosevelt Hospital on March 8, 1892. Three days before this, he had been suddenly seized with severe dyspnœa and orthopnœa, with some palpitation of the heart, but no cough. There was moderate cyanosis, the respirations were 20, and the pulse 130, and of high tension. There was poor pulmonary resonance, inspiration was inaudible, and expiration was prolonged. He improved rapidly under the administration of nitrite of amyl, nitro-glycerine, and iodide of potassium, and he was discharged from the hospital in about one week. He was readmitted two weeks later on account of a return of the dyspnœa, this time accompanied by cough and rusty expectoration; pulse 116, respirations 48, temperature 99°. The physical signs were about the same as before, but the urine now contained albumen and hyaline casts. He was somewhat relieved by nitro-glycerine gr. $\frac{1}{100}$ every two hours, with chloral and potassium bromide, and on April 19th he was allowed up. The next day he went into the yard, and returned with a chill. The temperature rose to 105°, there was cardiac palpitation and dyspnœa, and the next day there was found to be a clear serous effusion in the right pleural cavity; the patient was much prostrated, and his expectoration was bloody. His temperature ranged between 101° and 104° until the morning of the 25th, when it fell to 98°. He died of exhaustion on April 26th. At the autopsy forty ounces of serum and some recent fibrin were found in the right pleural cavity. There was a spot in the middle lobe of the lung which on section proved to be an abscess of the lung, surrounded by pneumonia. There was also a rather unusual malformation of the stomach—a sort of hour-glass contraction, and as there was no thickening of the muscular walls, and hence no irregular contraction to account for this peculiar curve, it was evident that it was a distinct indentation of the lesser curvature of the stomach. The heart was very much hypertrophied, and the kidneys contracted, showing the lesion of chronic diffuse nephritis. The condition of the heart, and especially the kidneys, would explain the dyspnœa.

Stated Meeting, May 25, 1892.

DR. H. P. LOOMIS, PRESIDENT, IN THE CHAIR.

SOLITARY TUBERCLE OF THE SUPRA-RENAL CAPSULE.

DR. MARTHA WOLLSTEIN exhibited under the microscope a specimen showing a rather unusual form of tuberculosis of the supra-renal capsule. The specimen had been taken from a child, ten weeks old, who had been admitted to the Babies' Hospital a short time before death with symptoms of dyspepsia and malnutrition. The child had been nursed only one month, and then fed on cow's milk for two weeks previous to admission. There was a decidedly phthisical family history. At the autopsy, the brain was found to be normal; there were miliary tubercles in the lungs, and a cavity in the left apex containing greenish pus. The bronchial glands were moderately enlarged, and many of them were cheesy; there were tubercles in the liver and spleen, but nothing was found in the kidneys except uric acid infarctions. The supra-renal capsules were normal in size, and apparently so on section, as were also the stomach, intestines, and mesenteric glands. Sections from the lungs showed acute miliary tuberculosis, the distribution being for the most part peri-bronchial. The sections from the bronchial glands showed conglomerate tubercles, and as the entire centre of the nodule was cheesy, it was impossible to say whether the poison had been brought to the nodules by the lymph current or by the blood. In the medullary portion of the supra-renal capsule, beyond the point reached by the incision, was one small tubercle, and some of the sections from this portion showed small round cells, and others, single giant cells, but no tubercle bacilli were present.

The presence of such a single, discrete, tubercle in the supra-renal capsule is rare, large cheesy masses being usually present. The specimen evidently illustrated a very early stage of tuberculosis of this organ, and the situation in the medulla was explained by the greater vascularity of that portion. From the amount of peri-bronchitis present, it is probable that the tubercle bacilli gained entrance through the lungs by aspiration, and that then the lymph nodules of the spleen, liver, and supra-renal capsules became successively infected. The healthy condition of the entire alimentary tract negatives the idea that the tubercular infection had its origin in the child's food.

DR. R. H. SAYRE presented gross and microscopical specimens from a case of

CARCINOMA OF THE BREAST FOLLOWING TRAUMATISM.

The woman was thirty-eight years of age, and the chest walls indicated that she had been the subject of rachitis in her youth. There was no family history of malignant disease except that the grandfather had had an epithelioma of the lip. In November, 1890, while carrying a heavy load of dishes, she fell, and was struck in the thorax by some of the falling dishes. She was examined by a physician who expressed the opinion that she had sustained a fracture at the junction of the costal cartilage with the fourth rib on the right side. In May, 1891, she again fell and injured the breast on the right side. This was followed by pain in this breast, and the appearance of a line of induration and swelling extending from the site of the first injury down to the nipple. Some time after this, she also noticed a small nodule in the lower part of the breast. In March, 1892, after a slight blow on the same breast, thick yellowish pus began to discharge from the nipple, and this continued up to the time when she first came under the speaker's observation. An examination of this discharge showed no tubercle bacilli present. The breast was removed, together with enlarged axillary gland. There was a small nodule in the lower part of the gland, and another in the upper portion. Below the pectoralis major muscle was a sinus containing pus, and leading up to the fourth rib, where there was some dead bone. Another sinus extended from this point to the nipple. Microscopical examination showed the nodules in the breast to be carcinomatous. The case was interesting on account of the possible connection between the traumatism and the development of the carcinoma.

DEMONSTRATION OF THE AMŒBA DYSENTERIÆ IN THE TISSUES.

DR. J. S. ELY demonstrated under the microscope the amœba dysentericæ in the ulcers of the colon and in an abscess of the liver. The material had been kindly furnished him by Dr. J. W. Brannan and was particularly interesting, as the specimens had been taken from the remarkable case of recurrent abscesses of the liver which had been recently reported to the Society by Dr. Edebohl.* Dr. Ely said that the whole subject had been so carefully worked out and described in an excellent monograph by Drs. Councilman and Lafleur of the Johns Hopkins University, that additional comment was unnecessary. The speaker

* See page 63.

said that on a previous occasion he had found this amœba in the stools of a patient, but, so far as he knew, this was the first time observers in this locality had had an opportunity of seeing the amœbæ in the *tissues*. The specimen had been stained with the ordinary double stain of hæmatoxylin and eosin.

THE PRESIDENT presented gross and microscopical specimens showing

DIFFUSE INFILTRATING SARCOMA OF THE HEART,

which had been removed from a single lady, twenty-five years of age, who entered the New York Cancer Hospital for the purpose of having an excessively hypertrophied breast removed. Her general health was good. The enlargement of the breast was of rapid growth, uniform, non-nodular, and but slightly painful. Before the operation was undertaken she developed a low form of fever, accompanied by intense dyspnœa and some delirium. She died suddenly at the end of the fourth week. The case being of peculiar interest was examined by a number of physicians. Those who ventured a diagnosis pronounced the disease typhoid fever. There was no eruption or enlargement of the spleen. The autopsy was made twenty-four hours after death, and at this time rigor mortis was present. Both breasts were enlarged, one to about four times the size of a normal breast. The body was well nourished, and there was an abundance of subcutaneous fat. The pericardium was distended with a sanguineous fluid, and the visceral layer was covered with a plastic exudation. The heart was hypertrophied, weighing sixteen ounces. There was no valvular lesion, but the cavity of the left ventricle was dilated. The walls of both ventricles were increased in size; the left measured $1\frac{1}{2}$ ctm.; the right, $\frac{1}{2}$ ctm. They were of a light-gray color, and softer than normal. The walls of the auricles were also increased in thickness. The coronary arteries were normal. The lungs, with the exception of pulmonary œdema and congestion, were normal. The liver was normal in size, and presented the "nutmeg" appearance. The spleen was normal. The kidneys were enormously enlarged, measuring six to eight inches in length; their capsules were non-adherent, they were softer than normal, and of a light-yellow color. On section, the cortex was increased in thickness and the markings gone. The kidney presented the gross appearance of the "granulo-fatty kidney." An examination of the intestines revealed nothing abnormal; there were no

typhoid ulcers. A few of the mesenteric glands were enlarged to the size of an olive, and the only lesion found in them, on microscopical examination, was hyaline degeneration of the capillaries.

The *microscopical examination* of the heart-muscle and of the kidneys revealed a most peculiar and interesting condition. Between the muscle-fibres of the heart were cells, larger and differing in appearance from pus-cells, or the cells of early connective-tissue formation. These cells were arranged in rows, or packed together between the muscle-fibres. These cells were found between all the muscle-fibres, which showed the effect of the compression by a certain amount of degeneration. Sections were cut from different places on both sides of the heart, and the same changes were found in all. Staining by Gram's method for micro-organisms revealed none of these organisms. A microscopical examination of different portions of the cortex of the kidney showed the renal tissue everywhere packed with these peculiar cells. Among the cells could be seen the compressed tubules. The capillaries of the glomeruli were normal, and contained none of these cells. No micro-organisms were present. In a very few places between the cells a delicate fibrinous stroma could apparently be discovered.

The speaker said that he had never before seen such condition in the heart or kidneys, and the only conditions which could account for the microscopical appearances already described were diffuse suppurative myocarditis, nephritis, diffuse round-cell infiltration, and diffuse infiltrating sarcoma. He believed it to be the last, as the cells were like the round cells of sarcoma, and between them in places was an intercellular substance. The enlargement of the breast he believed to be due to a rapidly infiltrating round-cell sarcoma. By metastasis the heart and kidneys were secondarily involved. Next, a pericarditis was developed. The excessive dyspnoea and the sudden death were explained by the cellular infiltration interfering with and compressing the muscle-fibres of the heart; in fact, it seemed surprising that such a heart could beat at all. Unfortunately, pieces of the breast were not removed for microscopical examination. A careful study of the literature of diseases of the heart-walls had aided but little in understanding this case. Sarcoma of the heart, even as a secondary affection, is a rare condition, and when it occurs it is generally circumscribed. Orth speaks of a rapidly advancing

sarcoma infiltrating the walls of both ventricles without producing a tumor. Drs. Prudden and Biggs had examined the specimens, and had stated that they had never met with this condition before. The former believed the lesion to be sarcomatous, and the latter was inclined to look upon it as a diffuse suppuration.

Dr. S. T. Armstrong said that the case reminded him of a similar one which had come under his observation while in command of the Marine Hospital at Memphis, and which was published in the *Annual Report of the U. S. Marine Hospital Service* for 1886. The patient was a negro, who when first admitted, had some bronchial symptoms, which were succeeded by diarrhœa. He was under treatment for about two weeks previous to his death, and the case was at first looked upon as one of typhoid fever. At the autopsy two tumors were found in the brain, which seemed to have developed in the pia mater, one in the right frontal lobe, and the other, in the left side of the cerebellum. The only other abnormality observed at the autopsy was an enlargement of the lymphatic glands, and of the liver, spleen, kidneys, and suprarenal capsules. Sections were made of all these organs, and microscopical examination showed the same round-cell infiltration observable in the specimens just exhibited under the microscope. His case was reported as one of lymphadenoma, or that variety of lympho-sarcoma which involves the glandular organs of the body.

Dr. J. M. Byron said that he recalled seeing in medical literature a report of a number of cases of diffuse infiltration of the heart and other organs by metastatic malignant growths, but he had not seen or heard of any thing just like the case under discussion. The specimens under the microscope possessed no reticulated tissue, or any of the characters which would characterize it as a sarcoma, and the cells were much larger and flatter than those seen in a small round-cell sarcoma; in fact, they resembled the "infant cells" of endothelioma.

Dr. J. S. Ely thought that the grouping of the cells in concentric layers around the blood-vessels was characteristic of endothelioma.

LOBAR PNEUMONIA POSSIBLY OF BACTERIAL ORIGIN.

DR. J. LEWIS SMITH presented specimens from a case of pneumonia occurring in a child, three-and-half years old. The child was an inmate of an institution where there had been during the

past winter an unusually large number of cases of pneumonia of uncommon severity. The ravages of the disease in this hospital had been so great in contrast with those in another institution with which Dr. Smith was also connected, that he had been led to believe that the pneumonia in the former place might be of microbic origin. The specimens presented were from a case which fairly illustrated the type of the disease. He hoped an examination by the Committee on Microscopy* would throw some light upon the etiology. The child had been in good health up to May 9, 1892, when the temperature suddenly rose to 105° , the respirations to 60, and the pulse was correspondingly increased in frequency. There was also some cough. Within twenty-four hours the disease could be located in the left upper lobe by the bronchial respiration and dulness over this area. After about a week, the disease appeared to be about to resolve, when the opposite lung became similarly affected over its upper portion. The child died yesterday of heart failure, with a pulse of 180, and a temperature of 105° . The rapid onset and the absence of a previous bronchitis would seem to indicate that the disease was lobar, rather than lobular.

Stated Meeting, June 8, 1892.

DR. H. P. LOOMIS, PRESIDENT, IN THE CHAIR.

THE COMMITTEE ON MICROSCOPY reported that the examination of the lungs presented at the last meeting by Dr. J. Lewis Smith showed them to be the seat of a typical catarrhal or lobular pneumonia. No micro-organisms were found.

DR. J. S. THACHER presented a specimen of

HORSESHOE KIDNEY.

He had met with this anomaly only once before, and that was in an infant, whose kidneys were presented to the Society a few months ago. In that case there was only one pelvis, and one ureter. The present specimen was taken from a middle-aged woman, who had had no symptoms which would lead to the suspicion of such an anomaly being present. Each ureter was partially occluded by calculi which had probably caused the extreme pyonephrosis which was also present. The two kidneys were united at their lower portions by a considerable mass of renal tissue.

* For report see below.

Dr. S. T. Armstrong said that this condition must be quite rare, as he had only met with it once in a considerable experience in the dead house, and in this case there was normal renal tissue even at the point of fusion.

DR. GEORGE P. BIGGS reported a case in which the connecting portion of a horseshoe kidney had been torn almost completely through, as a result of an injury. The patient was an adult, who had sustained a fracture of the body of the third lumbar vertebra by a truck running over the lumbar region. The connecting portion of the kidney was directly in front of this vertebra, and as a result of the laceration of its substance a very free retro-peritoneal hemorrhage had occurred.

DR. THACHER also reported two cases of

ABSENCE OF ONE KIDNEY,

and as a proof of this, exhibited the base of the bladder from each case, showing only one ureter. Each of these patients had lived past middle life without showing any symptoms referable to this condition. One died of chronic pulmonary tuberculosis, and the kidney was found to be about double the normal size, and apparently healthy. In the other case, the single kidney was the seat of a very extensive chronic nephritis, yet, notwithstanding the great damage done to this organ by the long standing inflammation, it was able to carry on the renal function for a long time. This patient also suffered from endarteritis, hypertrophy of the heart, suppurative pneumonitis, acute pericarditis, and cerebral softening.

Dr. Armstrong said that he had once seen, in an autopsy upon a man who died of uræmia, a very much degenerated kidney which was found to have been doing all the work, as there was only a mere trace of the other kidney, which had apparently been diseased in foetal life, and had therefore never developed.

DR. GEORGE P. BIGGS presented specimens from a case of

THROMBOSIS OF THE HEART.

The patient was a male, fifty years of age, who was admitted to New York Hospital on March 29, 1892. His previous history

was rheumatic and slightly alcoholic. One year ago, dyspnœa was first noticed on exertion, and last November, the urine became scanty and high-colored, the dyspnœa increased, and œdema appeared. On admission, the apex beat of the heart was found to be in the fifth space, four and a half inches to the left of the median line; no murmurs were heard; the pulse was rapid, but regular, and of fairly good quality; there was considerable fluid in the peritoneal cavity, and there was marked œdema of the lower extremities, and, to a less degree, of the abdomen. Examination of the urine showed it to have a specific gravity of 1018, and an alkaline reaction, but no albumen or sugar was found at this time. During the ten weeks he was under treatment, the urine remained scanty and high-colored most of the time; the specific gravity varied from 1012 to 1032, and the quantity of albumen from ten to sixty per cent. Ten days before death, he developed Cheyne-Stokes respiration with bloody sputum, and the diagnosis was made of cardiac thrombosis with pulmonary infarctions. The patient sank rapidly and died on June 6th. The temperature remained normal throughout. At the autopsy, there was found extensive general anasarca, a considerable quantity of fluid in all the serous cavities. The heart was hypertrophied and dilated, and weighed, when emptied of blood, 20 ounces. On opening the left ventricle, a firm cylindrical thrombus, measuring $8\frac{1}{2}$ ctm. in length by 2 ctm. in diameter, was found on the anterior wall. Its surface was perfectly smooth, and evidently no fragments had been broken off from it. The left ventricular wall corresponding to this attachment was very thin, measuring from $\frac{1}{2}$ to 1 ctm. in thickness, whereas in other portions the thickness was 2 ctm. In the branch of the left coronary artery running down the interventricular septum was found an old calcified thrombus, which nearly occluded the vessel. This accounted for the atrophy of the wall, and its conversion into fibrous tissue. No other thrombi were found in the coronary arteries, but they were extensively diseased throughout, small calcareous plates being found in various places. At the extreme apex of the right ventricle there was also a smooth, firm, and unbroken thrombus about $\frac{3}{4}$ ctm. in diameter. There were no thrombi in the auricles; the valves were normal, and the muscle substance was rather pale and soft. The lower half of the lower lobe of each lung was filled with infarctions, some red, and others whitish, due to a thrombosis of

the pulmonary artery. Over the area corresponding to the seat of these infarctions was an acute pleuritis.

Dr. J. S. Thacher said that within the past few weeks he had met with an almost parallel case, occurring in a boy. There was a large thrombus in the left ventricle.

Dr. BIGGS also presented specimens from a case of

ULCERATIVE ENDOCARDITIS.

The patient was a male, twenty years of age, a laborer, who was admitted to the New York Hospital on June 5th. Four days before admission, he had a severe chill, which was quickly followed by pain in the thorax, dyspnœa, cough, mucous expectoration, headache, and fever. On admission, his temperature was 104.5° , respiration 40, and pulse 108. Over the lower lobes of both lungs there was crepitation and slight dulness; the heart sounds were almost imperceptible, the abdomen, spleen, and liver were apparently normal, and his general condition was fairly good, with the exception of occasional slight delirium. The urine had a specific gravity of 1022, alkaline reaction, and the microscopical examination was negative. On June 6th, the temperature in the morning was 103° , and at midnight, 106.8° with a pulse of 140. During the latter part of the day, petechial hemorrhages were noticed in the hands and feet. On the following day there was a marked increase in the delirium, with rigidity of the back of the neck; the temperature rose to 108° , and the patient died in the afternoon of that day. The temperature immediately after death was 110.6° . There had been no secondary chill. At the autopsy, which was made two hours after death, rigor mortis was slight. Petechial hemorrhages and larger hemorrhages were found generally distributed over the body, but more especially over the hands and feet, and on the anterior surface of the wrist were a few pustules. There was no abrasion anywhere on the surface of the body except over one knee-joint, where one of the pustules had ruptured. The heart was normal in size. Between two of the cusps of the aortic valve, extending along the inferior surface, was a soft, friable thrombus, from which portions could be easily detached. On the right segment of the mitral valve there was also a soft thrombus which had been nearly detached. There were numerous endocardial hemorrhages.

On the surface of the heart were numerous petechial hemorrhages just beneath the pericardium, and three small pustules on the anterior surface of the left ventricle. The lungs were the seat of extensive petechial hemorrhages beneath the pleura; the left lower lobe was intensely congested, but there was no consolidation; there was a recent pleuritis over the base of both lungs, and sole blood-stained fluid in the pleural cavity. The spleen weighed one pound. Portions of this organ were very soft, and on section these softened areas discharged thin grumous pus. The kidneys were rather large, their capsules non-adherent, and scattered over their surface were numerous small abscesses, and a few white infarctions which had not yet broken down. There was a slight deposit of fibro-pus over the surface of the left lobe of the liver, and this lobe showed a large number of small abscesses on its surface, about the size of a pin's head. There was a small infarction near the base of the bladder, and this viscus contained about one ounce of purulent urine. Numerous infarctions were scattered through the intestinal canal. An examination of the pus from several of these abscesses showed apparently pure cultures of the staphylococcus. There was a large increase of serous fluid in the meshes of the pia mater of the brain and cord, but no purulent exudation. There were occasional small thrombi in the vessels, and in the lumbar portion of the spinal cord there was one small hemorrhage into the substance of the cord. The mesenteric glands were slightly swollen, and there were also three large cheesy masses, from 1 to 1½ ctm. in diameter, scrapings from which showed large numbers of tubercle bacilli. The lungs together with all the retro-peritoneal and bronchial glands were searched for further evidence of this disease, but none was found. No diagnosis was made during life.

Dr. Armstrong suggested that the presence of purulent urine in the bladder at the autopsy offered a possible clue as to the way in which the staphylococci gained entrance to the system, as he had known of fatal septicæmia resulting from the introduction of a catheter.

Dr. Biggs said that a careful examination of the entire penis had shown this organ to be perfectly healthy, and the purulent urine was evidently of very recent formation. He considered that the condition of the kidneys and of the bladder was a part of the general condition.

Stated Meeting, September 28, 1892.

DR. J. S. THACHER, VICE-PRESIDENT, IN THE CHAIR.

DR. S. T. ARMSTRONG presented a specimen of

APOPLEXY OF THE MEDULLA OBLONGATA.

The patient, a man, fifty-four years of age, was admitted to the Harlem Hospital, on September 22, 1892, having a family history which was negative as regards alcoholism and syphilis. He stated that he had been in good health up to September 1st, when he fell and fractured the tenth rib. With the exception of some pain on inspiration he did not feel sick, and was able to continue at his work until the afternoon of the 15th, when he was suddenly seized with severe pain in the head, became dizzy, and staggered towards the right side. With this there was numbness of the right side of the body and face, partial loss of power in the right arm and leg, and difficulty in swallowing, and from the onset of these symptoms, he was troubled with insomnia. His condition remained much the same for the next three days, after which he was confined to bed. At the time of his admission, on the 22d of September, he was conscious and able to give the history of his case. There was already motor paralysis of the right side of the body, and of the labial muscles on the left side of the face; on protruding the tongue, it was deflected to the right; muscular and tactile sense were not affected, and the pupils were normal. There was great difficulty at this time in articulating, and in deglutition; his pulse was 80, and his respirations 32 and somewhat labored. The urine contained albumen and a trace of sugar. When first seen by the speaker, on the day after admission, his condition was that described by the house-physician in the preceding history, and there was no special change until 1 A.M. on September 24th, when he became actively delirious, trying constantly to get out of bed, and when he did attempt to stand up he fell towards the right side. His pulse at this time was 85, the respirations 30, and the temperature normal. The pulse soon became rapid and irregular, the respirations slower, and at 5 A.M. he died of apnoea, the pulse continuing to beat for some time after the respirations had ceased.

At the autopsy the cerebral vessels were found to be congested, and there was a small hemorrhagic opening on the right side of the medulla oblongata, between the anterior pyramid and

the olivary body. The roots of the ninth nerve were also seen to be involved. The floor of the ventricle was probably also implicated. The condition of the urine was probably due to an affection of the kidneys, but these organs had not yet been examined microscopically. Death resulted apparently from the gradual softening consequent upon the hemorrhage. These cases are quite rare, and therefore this one was deemed worthy the consideration of the Society.

DR. E. HODENPYL presented a specimen of

PERFORATING ROUND ULCER OF THE STOMACH.

The patient was a young woman, nineteen years of age, who up to the time of her last illness gave a negative family and personal history. She had enjoyed good health up to last June, at which time she began to suffer from sharp pains in the left hypochondrium. These were quite severe for two weeks, and continued with diminished severity for the greater part of the whole summer. Quite recently they again became more troublesome, and on September 6th, while going upstairs, she was suddenly seized with intense pain in this region, followed by vomiting and marked prostration. When admitted to the hospital two days later she presented the usual signs of general peritonitis, and she died six days after admission.

On opening the abdominal cavity at the autopsy, the whole of the organs were concealed by a thick layer of fibrin and pus, which formed a sort of anterior cavity in the abdomen, which communicated with an opening in the stomach through which the contents of the stomach passed. The perforation was on the anterior wall of the stomach near its middle, and measured 2 cm. in diameter; the edges were perfectly round and smooth, the surrounding wall of the stomach was thickened, and the mucous membrane looked fairly normal. Near the œsophageal opening were small ulcers which involved only the mucous membrane.

DR. R. H. SAYRE presented

A SPECIMEN SHOWING THE RESULT OF OSTEOCLASIS,

which had just been given him by Mr. Nicholas Grattan, of Cork, Ireland. It was removed from a child about five years of age, upon whom he had performed osteoclasia for genu valgum about three or four months before the child died of a tubercular menin-

gitis. The operation was done with Mr. Grattan's osteoclast. The specimen shows the changed direction of the femur, but there is no callus, and no irregularity of the bone, and were it not for a sharp twist in the outline of the bone, one would hardly notice that any violence had been done to it. The speaker said that he had operated with Mr. Grattan's osteoclast, and had noticed that the feeling of "the break" was peculiar; the sensation was as if the periosteum had not been torn, and something still held the broken fragments in position.

Dr. S. T. Armstrong said that an examination of the specimen made it doubtful if there had been anything more than a "greenstick" fracture produced at the operation.

Dr. Sayre replied that the click produced at the time of the fracture was so sharp and distinct, that he was inclined to think that the instrument did really produce a complete fracture. He had never believed before this, however, that the periosteum was sufficiently elastic to remain intact under the application of such a force.

A CURIOUS ANOMALY OF THE FOOT.

DR. R. H. SAYRE also presented a growth which he had removed from the foot of a child, and which resembled a thumb. On one foot there was an extra toe between the big toe and the next one, and the end of the big toe was turned in almost at right angles with the other phalanges. On the other foot, the small toes projected in various directions, and were imperfectly provided with joints and nails. Instead of a large toe on this foot, there was a digit which in appearance, and in the manner of its attachment, resembled a thumb. It possessed an articulation like that of the thumb, and when the boy walked it was turned in under the sole. This "thumb" was removed by amputation.

Stated Meeting, October 26, 1892.

DR. H. P. LOOMIS, PRESIDENT, IN THE CHAIR.

POTT'S DISEASE, ASSOCIATED WITH FIBRINOUS PERITONEAL AND PLEURITIC ADHESIONS.

DR. H. S. STEARNS presented a specimen, showing the diseased vertebra from a case of Pott's disease. The specimen was not of

special interest in itself, and his only object in presenting it was to elicit a discussion on an associated condition. The patient was a colored man, thirty-five years of age, who for three years past had suffered from pain in the back, consequent upon caries of the spine. When admitted to the hospital last May, there was considerable deformity of the spine, with partial paralysis and marked anæsthesia of the lower extremities. He died on October 25, 1892, and at the autopsy it was found that there were old fibrous adhesions in the pleural and abdominal cavities, sufficient to almost obliterate these cavities. The lungs were removed with difficulty, and the intestines were extensively matted together. There was no fluid in either cavity, and careful search failed to show any tuberculous lesions, either in the intestine or in the lungs. The liver was of normal size, but was pressed upward on the right side above its normal position. There was no pus found anywhere except at the seat of the disease in the spine, where an abscess cavity was found extending up alongside of the affected vertebræ. Some of the adhesions in the peritoneal cavity were of comparatively recent formation. Dr. Stearns asked for an expression of opinion as to the cause of this fibrinous exudate.

Dr. H. M. Biggs considered the case to be one of tubercular peritonitis and pleuritis, with disappearance of the tubercular lesion, and the formation of fibrous adhesions. He had long believed that there was no variety of tuberculosis in which there was such a large percentage of spontaneous recoveries as in tuberculosis of the serous membranes; indeed, he believed that this was the termination of the majority of these cases, although he could not prove the correctness of his position. The original miliary tubercles being very small, they are lost sight of when the cells undergo degeneration, only fibrous tissue remaining, and there is nothing to stamp this process as tubercular. There is no question but that we find, not infrequently in the cicatrization of tubercular processes in the lungs, no vestige of this process except simply fibrous tissue—what might perhaps be called an “interstitial pneumonitis,” yet from the history of the case, and from the nature of the surrounding tissue, there is every reason to believe that this fibrous tissue is the result of a tubercular process.

Dr. S. T. Armstrong did not think that this view was the one generally held, and he saw no reason for expecting a different pathological lesion in tuberculosis of the serous membranes from that found in tubercular processes elsewhere. Even in the stage

of degeneration, there should be a recognizable lesion. The speaker referred to a very similar case to that just reported, which he saw ten years ago. He could not recall the details of this case, but he remembered that there was no history of traumatism, and that he had looked upon the case at that time as an instance of recovery from an idiopathic peritonitis.

Dr. R. H. Sayre said that he had exhibited to the Society last year a specimen taken from the spine of a boy who, at the time of his death from tuberculosis, had symptoms of beginning inflammation of the spine. In this case, the intestines were matted together into large masses by adhesions, and the retro-peritoneal glands were very much enlarged, yet there were no tubercles visible to the naked eye.

Dr. W. P. Northrup referred to a case of tuberculosis which he had observed during life, and upon which he had made an autopsy. No tubercle bacilli could be demonstrated, and only a few giant-cells were found, but all the pathologists who saw the case, among others, Dr. Francis Delafield, were of the opinion that the tuberculosis was well on the road to recovery. He was inclined to endorse in the main the views expressed by Dr. Biggs.

SUDDEN DEATH FROM IMPACTION OF MEAT IN THE LARYNX.

DR. H. M. BIGGS presented a larynx removed from a man who had died very suddenly, and his object in presenting it was to give greater prominence to a not uncommon cause of sudden death, namely, the lodgment of foreign bodies in the larynx. This man, while sitting in a restaurant eating soup, was observed to cough suddenly and to have a slight convulsion, and in a moment he was dead. After hearing this history, and before making the post-mortem examination, the speaker had expressed the opinion, based on a dozen or more similar cases, that death in this case was due to suffocation from the presence of a foreign body in the larynx. An important point in the history is the occurrence of a slight convulsion. At the autopsy, a very large piece of meat was found so situated as to absolutely occlude the larynx. Death certainly does not take place in these cases from suffocation simply, but whether or not it was due to a reflex inhibition of the heart's action, he could not say. He had seen quite a variety of foreign bodies in the air passages, thus: in one case, a collar-button formed a complete ball-valve; in another, a screw was

found ; in a third, a toy balloon had been drawn into the trachea, and was inflated with each inspiration ; in still another, a bronchial gland had caused suffocation by discharging its contents into the trachea.

DR. GEORGE P. BIGGS presented a specimen of

HYDATID CYST OF THE LIVER,

removed from an Italian, thirty-five years of age, who died as a result of stab wounds of the abdomen. No history bearing upon the specimen was obtained. At the autopsy, a cystic tumor was found occupying nearly the whole of the right lobe of the liver, and measuring 12 ctm. transversely, by 10 ctm. vertically, and 9 ctm. in its antero-posterior diameter. The anterior wall of the cyst was only about $1\frac{1}{2}$ millimetres in thickness, and the posterior wall only about 1 ctm. from the posterior surface of the liver. There were no adhesions. The cyst was very tense, and, on incision, a large quantity of perfectly clear, colorless serum was discharged. The cyst was lined by a thick white membrane, and contained a large number of echinococcus cysts. Microscopical examination of the scrapings from the lining membrane showed numerous typical scolices and hooklets.

Dr. Biggs said he had accidentally discovered a method of staining these hooklets while engaged last summer in examining microscopically some pus which had been aspirated from the region of the liver for diagnostic purposes. The examination at first showed only tyrosin crystals, and a large number of degenerated pus-cells, but after staining a slide for tubercle bacilli, he was surprised to find a typical echinococcus hooklet which had been stained a bright red by the eosin. It had not been visible previous to the staining, and prolonged search afterwards only showed three such hooklets on this slide. The existence of a hydatid cyst was afterwards proven by operation.

POLYPOID HYPERTROPHY OF THE UTERINE MUCOUS MEMBRANE, WITH EPITHELIAL DEGENERATION.

DR. H. J. BOLDT presented two uteri which had been removed by hysterectomy on account of this condition. Both women had passed the menopause, and both had been curetted a number of times, but in view of the recurrence of hemorrhage, and the age

of the patients, and the possibility of the existence of malignant disease, he had thought it best to remove the uterus. The report of the microscopical examination by Dr. W. H. Porter showed that in the first uterus there was a well-defined papillary growth, over one and one half inch in diameter, some of the larger papillary projections extending fully one half inch beyond the original mucous surface lining the uterine cavity, while the peripheral and smaller projections were little more than microscopic points. Microscopical examination of the sections, made at right angles to the mucous lining of the uterine cavity, showed the new growth to be composed chiefly of a polypoid mass, and the papillary projections covered by a thick layer of hypertrophied and somewhat degenerated epithelium, which had constituted the original follicular structure lining the uterine cavity. There was no evidence of new follicles having been developed. This condition of the epithelial structure, modern pathology has designated as "adenomatous hypertrophy of the uterine mucous membrane." There was no distinct evidence of the basement membrane having given way, nor was there any well-marked invasion of the underlying lymphatic spaces with epithelial cells, as is commonly found in neoplasms having a carcinomatous character. At several points, however, the basement membrane appeared to be on the point of rupturing, with the inevitable result of the development of a truly carcinomatous neoplasm. Such growths as these are hardly to be called adenomatous, for there is no production of a new gland tissue ; it is more correct to speak of the condition as a polypoid hypertrophy of the lining membrane of the uterus with epithelial degeneration. In all these cases there is a common tendency to steady progression, and ultimately to the formation of a truly carcinomatous neoplasm. The second specimen is very similar to the first, except that the growth is less distinctly polypoid in character, and there is more distinct evidence of its carcinomatous nature. The sections from this specimen showed marked proliferation or an angiomatous condition of the vessels in the muscular tissue of the uterus, immediately underneath the mucous membrane, with increase of connective tissue between these vessels, so that in many places the appearance was not unlike that presented by a round-cell and spindle-cell sarcoma. This condition, which has been erroneously called inflammatory, is unquestionably the result of increased nutrition from the dilatation of the uterine vessels. In this specimen the deeper lymphatics had

been invaded by epithelial elements, and the evidence of a carcinomatous development was quite marked. These cases eventually undergo malignant degeneration, except in occasional instances, when the endometrium has been entirely removed with a sharp spoon.

CARCINOMA, COMPLICATED WITH MYOMATA, DOUBLE HYDROSALPINX, AND CYSTIC OVARIES.

DR. BOLDT also presented two uteri removed for the above condition.

The first specimen was removed from a patient, fifty-three years of age, who for the past six months had had irregular uterine hemorrhages. Her attending physician, Dr. Henry Ruhl, made a clinical diagnosis of carcinoma, and referred the case to the speaker for operation. This diagnosis was confirmed anatomically before the removal of the uterus. Examination showed not only the presence of myomata, but also of much infiltration around the uterus, and the elasticity of this infiltration showed it to be the result of previous inflammation, and not of malignant disease. In the second case, a carcinomatous uterus containing a fibroid in its body was removed by the same method, and the patient left the hospital on the eighth day.

The speaker said that the entire uterus should be invariably removed in every instance when the microscopical examination had confirmed the diagnosis of malignant disease, no matter how limited this disease may appear to be, for it has been found that although there may be only a small area of disease about the portico or the cervix, independent nodules may exist in the body of the uterus.

Dr. Boldt said that in three of his cases myomata had been associated with carcinoma in women in advanced life, and it was of such comparatively frequent occurrence that he was inclined to believe that the irritation produced by these myomata is prone to give rise to malignant degeneration.

The President and Dr. H. M. Biggs both stated that they had very rarely met with carcinoma and myoma in the same case.

INDUCTION OF CHLOROFORM NARCOSIS DURING SLEEP.

DR. W. P. NORTHRUP said that a child of twenty-two months had been recently brought to his office on account of an offensive

nasal discharge which had existed for some time. With an Escherich inhaler, chloroform was successfully administered without awakening the child, and then there was no difficulty in removing a shoe-button from the nose. So far as could be ascertained, it must have been in the nose for at least three months. The speaker emphasized the importance of examining the nose for a foreign body whenever there has been a persistent and profuse discharge *from one side of the nose.*

. *Stated Meeting, November 9, 1892.*

DR. H. P. LOOMIS, PRESIDENT, IN THE CHAIR.

DR. J. LEWIS SMITH presented specimens from a case in which the diagnosis was doubtful. The patient, a girl, three years old, was admitted to the New York Foundling Asylum three months ago in an apparently dying condition. No history of her condition immediately preceding her admission could be obtained. At the time of entering the asylum the radial pulse was imperceptible, the respirations were 64, and the temperature 106° in the rectum. Soon after this she was seized with severe general convulsions, for which no cause could be assigned. The urine was examined, but with negative result. The child improved rapidly after these convulsions ceased, and was soon apparently well. She remained in this condition for three months, when suddenly at 3 A. M., on November 4th she had another attack of convulsions, accompanied by a rise of temperature to 105° , and the pulse 180, with 58 respirations per minute. Seven hours later, she was partially conscious, the convulsions had been controlled, and auscultation of the chest showed only harsh respiratory sounds. The urine still continued to yield a negative result on examination. She passed a fairly quiet night, and when first seen by the speaker, on the following morning, her pulse was 140, respirations 44, and temperature 104° in the rectum, and she had a peculiar vacant stare. When the arms were raised above the head, and percussion made in the axillary region on the right side, some dulness was found, but only harsh breathing was heard over this area. There were no other symptoms present, and after a careful examination, the only diagnosis which was made, was that of pneumonia of the upper part of the right lung. Shortly afterwards, the urine was

again examined, and was found to contain about 20 per cent. of albumen, and some hyaline casts. By evening the pulse had reached 150, and was quite feeble, necessitating the employment of stimulants; the respirations were 43, and the temperature 105° . The following morning the temperature was 104° , and the child was constantly rolling the head, and throwing herself about the bed. She died at 6 P. M.

At the autopsy, the upper and posterior portions of the brain were found to be congested; there was some œdema over the convexity. On cutting into the brain, the sinuses were found filled with long fibrinous plugs, and in some portions these were blood-stained. The larynx and trachea were normal. The upper lobe of the right lung was uniformly consolidated, the finer bronchial tubes posteriorly contained dark-red and slightly granular plugs of fibrin. A similar exudate was found over the portion of pleura corresponding to this part of the lung. The heart, liver, and spleen were normal. The intestines contained a good deal of mucus, and the solitary follicles and Peyer's patches were swollen, but not ulcerated. The kidneys were swollen and congested, the capsules not adherent, and the markings were obscure.

Even in the light of the pathological examination, the diagnosis was still doubtful. There was a possibility of the case being one of cerebro-spinal meningitis. Ever since 1871, when the disease first appeared as an epidemic among the horses of car lines, it had been endemic in this city, although at present cases of this kind were comparatively rare. It would seem, however, that in this case there had been sufficient time for the formation of an exudation of fibrin around or upon the brain at some point, and there should have been during life some rigidity of the spine and retraction of the head. Shortly before death, this child was able to bring the head forward to take a drink. It was possible, also, that the child might have had a mild form of typhoid fever, which had been overlooked until the occurrence of the severe symptoms which ushered in the pleuro-pneumonia. In young children, it is sometimes extremely mild, and runs its course in from five to nine days. He had seen typhoid fever occur in children who were up and around during the whole course of the disease, yet the diagnosis was confirmed by the adult members of the same family soon developing the disease in its typical form. Personally, he was of the opinion that the severe convulsions in the case just reported, accounted for the condition of the brain,

but he could not explain the appearances found in the intestinal canal.

DR. EUGENE HODENPYL presented specimens from two cases of

MALIGNANT ULCERATIVE ENDOCARDITIS.

The first specimen was removed from a man, forty-one years of age, a laborer of intemperate habits, who had had eight attacks of acute articular rheumatism, and for ten years past had suffered from palpitation and dyspnœa on exertion. For the past four months the dyspnœa and palpitation had become much more troublesome, and had been associated with cough and muco-purulent expectoration. The urine had been scanty during the last two months, and the patient had rapidly emaciated. One week before admission his feet became swollen, and the dyspnœa quite severe, and when he entered the hospital his pulse was 102, respirations 28, and the temperature 100.2° F. The urine had a specific gravity of 1010, and contained a trace of albumen. The apex of the heart was found in the fifth space, in the nipple line, and its action was regular. There was a loud systolic murmur, and a circumscribed presystolic murmur at the apex. One week after his admission he suddenly lost consciousness, and died in a few hours. During his stay in the hospital his temperature had been irregular, varying from 99° to 101° F. The autopsy showed a sacculated pleurisy, with effusion in the lower part of the left chest, and both lungs œdematous and partially consolidated. The heart-muscle was flabby, the aortic valves thickened, and the mitral valve was thickened, stenosed, and covered with vegetations. It was also the seat of ulceration, and immediately behind this was a small abscess. The right heart was normal. The kidneys were small, and contained many cysts; the capsules were adherent, the cortex thinned, and the markings obliterated. The blood-vessels at the base of the brain appeared to be normal. The left hemisphere was occupied by a very large blood clot. Dr. Cheesman made cultures from the ulcerated mitral valve, and these showed the presence of the streptococcus pyogenes.

The second specimen was removed from a man, forty-seven years of age, of intemperate habits. He stated that he had had chancre twenty-two years ago, but had never had rheumatism. One week before admission, after exposure to wet, he began to cough and to expectorate dark-colored mucus, and three days

later he was seized with severe pain in the right side of the chest, the breathing became more rapid, and, according to his friends, he was occasionally delirious. On admission, he was slightly cyanosed, the pulse was 118, respirations 48, and the temperature 102.8° F. The urine had a specific gravity of 1004, and contained a trace of albumen, and granular and hyaline casts. Physical examination showed dulness from the right apex anteriorly to the fourth rib, and from the fourth to the sixth rib tympanitic resonance with bronchial breathing over the area of dulness, and broncho-vesicular respiration over the tympanitic area. All over the right side of the chest, anteriorly and posteriorly, were numerous crepitant râles, and posteriorly there was dulness down to the angle of the scapula, and below this tympanitic resonance. Over both areas breathing and voice were bronchial in character. Over the left side of the chest, posteriorly from the apex to the angle of the scapula, and near the vertebral column, bronchial râles were heard, but these are evidently transmitted from the right side. All over this side of the chest the breathing and voice were exaggerated. The apex-beat of the heart was imperceptible, and the heart-sounds were heard most distinctly in the fifth space. The action of the heart was regular but feeble. The patient remained almost constantly delirious, with an irregular temperature, varying from 102° to 104.5° F., until his death, nine days after admission. The autopsy showed recent adhesions over the upper part of the right lung, and a few old adhesions over the posterior part of the left lung; the latter was congested and œdematous. Portions of the right lung were consolidated, and the whole lung was studded with large and small abscesses, some of which communicated with branches of the pulmonary artery. The heart was flabby, and there were patches of thickening on the visceral pericardium. The aorta was normal, but the aortic valves were greatly thickened and stenosed, and were the seat of extensive ulceration, which had produced perforation through one cusp. The papillary muscle was streaked with pus. There was also hypertrophy of the wall of the left ventricle, with dilatation. The spleen was enlarged, soft, and friable. The left kidney was large and pale, its cortex was thick, and the markings indistinct, while the right kidney was the seat of several red and white infarctions. Cultures made by Dr. T. M. Prudden from the heart vegetations, papillary muscle, kidneys, and lungs, showed the presence of the streptococcus pyogenes; and cultures from the

abscesses in the lungs showed the presence of the staphylococcus pyogenes aureus. Those made from the spleen were negative.

Dr. Hodenpyl stated that in looking over the literature of malignant ulcerative endocarditis it was interesting to note the many different species of bacteria which have been found associated with this lesion of the heart.

He had been able to collect forty-three cases in which a bacterial examination had been made :

Buday Orvosi, *Hetilap.*, 1889, No. 7, 3 cases.

Trombolau Fava, *Riforma Med.*, 1889, No. 176, 1 case.

Weichselbaum, *Ziegler's Beiträge*, No. 4, 1888, 15 cases.

Gilvert and Leon, *Compt. Rend. de la Soc. de Biol.*, 1889, p. 21, 1 case.

Girode, *Compt. Rend. de la Soc. de Biol.*, 1889, p. 622, 6 cases.

Perret and Rodet, *Compt. Rend. de la Soc. de Biol.*, 1889, p. 724, 1 case.

Lauceraux, *Union Méd.*, 1886, No. 100, 2 cases.

E. Fränkel and Sängner, *Centralb. f. klin. Med.*, 1886, No. 34, 9 cases.

Biggs, *Proc. N. Y. Patholog. Soc.*, 1888, p. 37, 2 cases.

Prudden, *Amer. Jour. Med. Sci.*, January, 1887, 1 case.

Ziegler, quoted by Prudden, 1 case.

Myscokowitsch, quoted by Prudden, 1 case.

Of these forty-three cases, the staphylococcus pyogenes albus was found in two cases ; the staphylococcus pyogenes aureus in fourteen cases ; the streptococcus pyogenes in six cases ; the bacillus typhosis in one case ; the diplococcus pneumoniae in one case ; the bacillus tuberculosis in one case ; the bacillus foetidus in three cases ; in ten cases the species were not determined.

From this it would seem safe to assume that the disease is never a primary one, but will always be found associated with some other lesion, of an infectious nature, in other parts of the body.

Dr. T. M. Prudden said that the bacteriological literature of malignant endocarditis was so meagre, that every opportunity should be improved for making cultures, and enlarging our knowledge of this subject. Apart from its intrinsic interest, it was a perpetual source of instruction, for it illustrated the importance of a local lesion in favoring the growth of the bacteria. It is probable that in every case of malignant endocarditis there is some antecedent lesion of the valves which has caused the de-

velopment of the growth of bacteria in this situation. It is a little curious that the bacteria circulating in the blood should not set up a suppurative inflammation in the glandular organs, but when once beginning on the valves of the heart, secondary abscesses are very prone to follow.

MILIARY TUBERCULOSIS AND GUMMATA, OCCURRING IN THE SAME LUNG ; THEIR DIFFERENTIAL DIAGNOSIS.

DR. HODENPYL also presented a specimen showing miliary tubercles and gummata in the same lung, and exhibited the characteristics of each under the microscope. The specimens were removed from a middle-aged man, who died, in the hospital, of delirium tremens. Notwithstanding his habits of life, he was an example of unusually good physical development, and all the organs except the right lung were normal. This lung showed in its upper two thirds a considerable number of small, grayish, hard nodules, closely resembling in appearance the miliary tubercles. Scattered about the lung were other and larger nodules, about one fourth of an inch in diameter, round and hard. On section they presented a white surface, and surrounding them was a zone of pearly hue. It was interesting to note in connection with this case, that although this man was intemperate and dissipated, and had considerable disease of the right lung, there were no symptoms during life referable to this condition, and the tubercles and gummata were shown under the microscope to be fibrous. The case was a rare one, and of unusual interest, as bringing up the question of the differential diagnosis between tubercles and gummata. Although there is apparently no good reason why they should not be associated together, especially as we know that syphilis is very apt to be followed by tuberculosis, this was the first time he had met with the two conditions in the same organ. It is well known that chancre and chancroid cannot be differentiated by microscopical examination, and that the morphological characteristics of tubercular and syphilitic inflammation have many points in common. In many cases the specific bacterium of tuberculosis may be of assistance in the diagnosis, but as yet there are no well founded claims for the existence of such an organism in cases of syphilis. The following points of differential diagnosis may be emphasized, although, of course, there are many exceptions to the general statements made :

1. The history of tuberculosis in the one case, and of syphilis in the other, may be of importance.

2. The bacteriological examination is usually positive in tuberculosis, unless the tubercles are very old and fibrous ; it is negative in syphilis.

3. Inoculation experiments are usually positive in tubercle, and negative in gumma.

4. Tubercles are usually present in considerable numbers, and are scattered throughout the entire organ, and throughout the body ; gummatous deposits are usually single, or are present in small numbers, and are confined to a single organ.

5. Tubercles are usually much smaller than gummata.

6. Tubercles show a marked tendency to undergo cheesy degeneration and to form cavities ; gummata regularly become cheesy, but do not break down, remaining dry and tend to undergo calcification.

7. Amyloid degeneration is sometimes present in tubercles, but, so far as known, is absent in gummata.

8. On section, the tubercles appear as round or irregular grayish masses, often soft or cheesy in the centre, and surrounded by a zone of inflammatory products ; gummata appear more or less spherical, the larger portion of the nodule is in the condition of coagulation necrosis, which is rather dry and not broken down. They are surrounded by a zone of fibrous tissue.

9. Microscopical examination will show the presence of tubercle bacilli in the tubercles ; but no characteristic micro-organism is present in syphilis. Giant-cells are present usually in tubercles, and are usually absent in gummata.

DR. J. S. ELY exhibited under the microscope specimens of gummata from a case of hereditary syphilis in a child. In its structure the specimen very closely resembled that of miliary tubercles.

DR. MARTHA WOLLSTEIN also exhibited a slide illustrative of the difficulty of differentiating between syphilis and tubercle. The specimen was taken from the lung of a child twenty-two months old. There was no family history of syphilis. The maternal grandfather died of acute phthisis about one year before the birth of the child. At the time of admission to the hospital, there was dactylitis, a consolidation of the right lower lobe of the lung, and a very fetid purulent otitis. At the autopsy the left lung and pleura appeared to be normal. The right lung also appeared

normal, except the lower lobe. This was covered by recent pleuritic exudation, and the substance of the lobe was riddled with cavities of varying size, filled with a soft cheesy material. The parietal pleura over this lobe was studded with small masses, apparently cheesy, and similar masses were found on the peritoneal surface of the diaphragm. There were also a few small, solid nodules in the lower lobe of this lung, which resembled gummata, and even on microscopical examination the existence of giant-cells and also of cheesy matter made the differential diagnosis extremely difficult. The peritoneum also showed the presence of cheesy matter and giant-cells. The liver, spleen, and kidneys were absolutely normal. About fifty sections were stained, but no tubercle bacilli were found; hence, the diagnosis of syphilis was made.

DR. J. S. THACHER presented specimens from two cases of

MELANO-SARCOMA WITH MELANURIA.

Both occurred in St. Luke's Hospital, one in the service of Dr. Davis, and the other in that of Dr. Ball. In the first case, there was an enormous melanotic tumor of the liver, probably secondary to a similar growth in the eye. In the second case, there was a large melanotic growth at the base of the left lung, also several subperitoneal tumors, and two similar growths in the posterior part of the left cerebral hemisphere. In one case, the correct diagnosis was suspected shortly before death; and in the other, a partial diagnosis was correctly suggested. Both cases gave a marked reaction for melanine in the urine, and they are reported chiefly on account of the assistance which this urinary reaction sometimes renders in making the diagnosis, particularly where, as in these cases, the other symptoms were obscure.

The first patient, the one with the tumor of the liver, was a sea captain, forty-nine years of age, who for two years previous to his death had experienced great distress after eating, a sense of constriction about the waist, and sometimes a sharp stabbing pain. He sometimes vomited, with relief, but he had never raised any blood. For the past year he had noticed an enlargement of the abdomen, and during this time he had been troubled with constipation and flatulence.

During the last few months of his life he lost flesh and strength rapidly. There was slight jaundice at times. On examination,

the liver was found to nearly fill the abdomen, and sixteen ounces of a dark-brown fluid were withdrawn from the abdominal cavity by aspiration. At the autopsy, the liver was found reaching to within two inches of the symphysis pubis, and to within one inch of the extreme left of the abdominal cavity, the top of the diaphragm lying on the right side at the level of the third rib, and on the left side at the level of the fourth intercostal space. The liver weighed twenty-nine pounds, or as much as eight or nine normal livers. Its right lobe was very firm, of a dark-bluish color, and presented on its surface numerous whitish nodules, one to six millimetres in diameter. On section, it was of a dark-brown color, with nodules like those found on the surface. The left lobe presented a cystic tumor, ten inches in diameter, and on puncturing it dark blood spurted out. On introducing the finger into the cavity the contents appeared to be soft clots. No other tumors were found. Some years ago the patient had had one eye enucleated for some trouble, the nature of which could not be ascertained. The heart, spleen, and kidneys presented on section an unusually dark color.

The second patient was a housewife, fifty-three years of age, who had been under observation only five days before her death, and whose mental dulness prevented her giving a satisfactory history. She suffered from general malaise, vomiting, often brought on by eating, and headache. Her pulse was rapid and feeble, but regular. The temperature was normal, except that on the day of her death it rose to 101.6° . The physical examination of the chest showed only dulness on percussion over the lower part of the left lung, and at the upper border of this area of dulness the respiratory murmur was increased and there were subcrepitant râles. She stopped breathing and became cyanotic when turned on her right side, one quarter of an hour before her death, but the breathing recommenced when she was turned again on her back. The usual examination of the urine was negative. At the autopsy, there was found at the base of the left lung, and attached to the diaphragm, a nodular tumor, six inches in diameter, black, partly of grumous consistency, and partly firm enough to slice. A similar nodule, two inches in diameter, was found at the surface of the left occipital lobe of the brain and dipping into its tissue, and in the white substance of the posterior part of the left parietal lobe was a nodule, one and a half inches in diameter. Four subperitoneal tumors pre-

senting the same appearance, and varying from one and a half inches to two and a half inches in diameter, were found attached to the intestine, omentum and abdominal wall. On section, the heart, liver, and kidneys were of a dark color. Specimens were shown from the lung, peritoneum, and brain. Microscopical examination showed in both cases that the growths were spindle-cell sarcomata, with a large amount of pigment. The urine from the first patient was turned a very dark color on the addition of acids; hydrochloric acid colored the whole urine quite dark, and gave a very heavy black precipitate. The urine obtained from the bladder of the second patient gave the same reaction, though not so marked. Either nitric acid or hydrochloric acid produces a nearly black color, and a similar reaction is obtained on the addition of chloride of iron.

Dr. Thacher said other cases had been reported, in which the black coloring matter had been recognized in the urine, where internal melanotic tumors were present, yet the chemistry of this coloring matter is not well understood. When the urine is first voided, it is normal in color, but after standing a while, it becomes darker, and the color is deepened by the addition of oxidizing agents. It has been stated that the coloring matter was not always of the same composition, and that it has been detected in cases other than melanotic tumors—for instance, in marasmus; yet these are so exceptional, that the presence of the coloring matter may be considered of considerable value in diagnosing the existence of melanotic tumors. The best reaction is obtained with a moderately strong solution of chloride of iron, the dark color first produced deepening after standing for some time. Dr. Thacher then demonstrated this test.

Dr. D. H. MCALPIN presented for Dr. Biggs, specimens of

MILIARY TUBERCULOSIS OF THE LUNGS AND KIDNEYS, WITH
TUBERCULAR ULCERATION OF THE BLADDER.

The bladder showed perforating ulcers going down to, and in some cases even through, the mucous coat. There were a few miliary tubercles in the lungs, and calcified areas at the apices.

Dr. Thomas H. Manley asked whether the point of original infection was in the lungs, or by way of the bladder, as it had been claimed that the kidneys might be affected by an ascending or a descending infection.

Dr. McAlpin replied that the tubercles of the lungs presented the ordinary tubercular cicatrices with calcification of the pleura. He could not say positively as to the origin of the infection, but it probably began in the lungs.

Dr. S. Alexander said that at the present time genito-urinary surgeons generally considered tubercular ulceration of the bladder to be much more common as a result of general tuberculosis than of secondary tuberculosis of the lungs. Personally, he knew that in many instances there is a tubercular ulceration of the bladder without any involvement of the lungs, though he had never seen tubercular ulceration or miliary tubercles of the bladder where the seminal vesicles or the prostatic urethra were not affected. He did not know whether or not the disease originated in an ascending infection of the urethra, but the comparative rarity of tubercular disease in the anterior urethra was opposed to such a view.

Stated Meeting, November 23, 1892.

DR. H. P. LOOMIS, PRESIDENT, IN THE CHAIR.

MULTIPLE BENIGN CYSTIC EPITHELIOMA OF THE SKIN.

Dr. J. A. FORDYCE presented a patient, and a report of two cases of this rather rare condition, occurring in a mother and her daughter. The daughter, a healthy-looking girl of nineteen years, first came under his care. As nearly as could be ascertained, the first thing noticed was the appearance of a number of small pimples, about the size of a pin's head, on the left temple and forehead, about six years ago. Similar papules appeared behind the left ear, and over the face and neck, and some of them reached the size of a split pea. When first seen by the speaker, there were numerous small translucent pearly-looking tumors, scattered over the forehead, temples, eyelids, cheeks, and nose, behind and below the ears, back of the neck, and through the hair. In general, the growths were discrete, firm, and painless to the touch, and in color differed but little from that of the surrounding skin. A central depression was noticed in several of them, giving them an appearance very similar to that of the lesions of molluscum contagiosum. Some of the tumors simulated vesicles quite closely, but puncture caused slight bleeding, and revealed a solid forma-

tion. The majority of the larger growths were covered with minute capillaries, and intermingled with the lesions were telangiectases and black pigment spots. Scattered among the small translucent lesions were a large number of white papules, differing in no respect from ordinary milia.

The size, appearance, and general distribution of the lesions in the mother were almost the counterparts of those on the daughter's face. She stated that her attention was first attracted to the eruption when she was about fifteen years of age, and that her father had always had a similar group of tumors on his temple. The eruption in her case was on the forehead, face, and ears, on the anterior, lateral, and posterior aspects of the neck, and over the upper portions of the back, neck, and chest. Numerous telangiectases were found on the cheeks, and a few comedones here and there over the face. At the inner angle of her right eye was a large semi-translucent tumor, containing a number of white milium-like bodies, and covered with dilated capillaries. This lesion is about the size of two peas, and she thinks it has grown during the past year. These tumors cause no inconvenience, except a slight itching during the summer. Quite recently, Dr. Brooke has reported in the *British Journal of Dermatology* three exactly similar cases, occurring in a mother and her two daughters. The literature of this subject shows that these tumors usually appear about the age of puberty, the time when we expect the skin and its glandular appendages to show increased activity, and that they increase slowly in size until they attain the size of a split pea. Their surface remains quite smooth, and neither undergoes ulceration nor spontaneous involution; in other words, the entire course of the affection is free from any evidence of malignancy. So far, no external application, or internal medication has been successful in removing the growths. In the case presented, Dr. Fordyce had removed the majority of the larger tumors with a dermal curette, and the smaller ones with a comedo extractor. They are loosely attached to the surrounding tissues, and when the epidermis is broken, are readily separated. The little wound thus left heals readily with a slightly depressed scar.

Under low amplification, the derma is seen to contain a number of irregularly rounded, oval, and elongated masses, which take a deeper stain than the surrounding tissue. In some sections these cells intercommunicate in a remarkable manner. These masses

bear a striking resemblance to adenoma, but with stronger amplification these darkly stained masses are seen to consist of epithelial cells having the same appearance as the cells in the lower layers of the epidermis. They are enclosed in connective tissue which has undergone considerable thickening and condensation. While in some of the sections the epithelial cells are densely packed together without a distinct structure, in others they are made up of tracts, two or more cells wide, which are twisted and intermingled in the most complicated way. Linear tracts, two or more cells wide, ramify throughout the derma, connecting the cell masses, and occurring independently of them, the narrower ones closely resembling coil-gland ducts, although no distinct lumen can be made out. These tracts recall the atypical cell proliferation in true epithelioma. In other tumors, again, the cell-heaps are more complicated in their structure, and show the "pearls" and cell "nests" of malignant epitheliomata. These nests are found in all stages of development. Again, the cell tracts are so arranged as to form an alveolar-like structure, enclosing nuclei and such highly stained cells that a high power is necessary to reveal their presence. The walls of the alveoli, however, instead of being made up of fibrous tissue, consist of epithelial cells so arranged as to resemble the columnar cells of a cylindroma. The absence of an external limiting membrane is opposed to the view that the structure of these cell masses is glandular. Sections from the first tumors examined failed to show any connection between the new growth and the epidermis or glandular appendages, but further investigation of the tumors having a central depression revealed a direct down growth and proliferation of the epidermis, and also of the external root sheath of the hair follicles. Normal coiled glands and ducts were seen in a few sections, but they were less numerous than in an equal number of sections of the normal skin, while in some of the tumors none were found.

While it has been the almost universal custom to regard such histological appearances as pathognomonic of malignant epithelioma, the clinical appearance and natural history of the affection differ widely from the classical epithelial new growths. It is quite possible that benign epithelioma and adenoma sebaceum may have an analogous origin in foetal life, for, as all the appendages of the skin are formed by the in-growth of the deep cells of the stratum Malpighii during foetal development, it is rational to con-

ceive that under the influence of certain conditions, not understood at one time, cells destined to form sweat-glands, at another those intended for the formation of sebaceous glands, and again those of an indifferent nature, might be cut off from the germinal layer, or retain their embryonic nature until brought into activity through some influence during the development of the individual. The use of the term "epithelioma molluscum" for molluscum contagiosum affords a precedent for enlarging the meaning of epithelioma, and no valid argument can be brought forward against the use of that term for this affection, which is so clearly demonstrated to be of an epithelial nature. The dividing line between benign and malignant epitheliomata is yet undetermined.

Dr. T. M. Prudden said that, according to Thiersch's theory of the development of epitheliomata, the balance normally existing between the growth of epithelial cells and the resistance to such growth offered by fibrous tissue is disturbed, the atrophy of fibrous tissue in the skin, which occurs in old age, explaining the more frequent occurrence then of epitheliomata. Similarly, it might be supposed in the case just presented, that there exists an hereditary lack of resistance on the part of the fibrous tissue to the growth downward of epithelium in the skin. The existence of spined cells should be sufficient to decide between adenoma of the sweat-glands and a growth from epithelium of the skin.

Dr. Ira Van Gieson referred to the researches of Hauseman concerning the character of the karyokinetic figures in epitheliomata. Hauseman found that in epitheliomata the karyokinetic figures were quite uniformly asymmetrical, that is, appropriate staining fluids would bring out an unequal number of strands on the two sides of the equatorial plane, or show other irregularities in the various phases of mitosis. From the fact that in normally growing tissues, *e.g.*, in the regeneration of the rete Malpighii, the mitotic figures are remarkably symmetrical and regular. Hauseman suggested the very fascinating hypothesis that certain epitheliomata might have their origin in some epithelial cells, which departs from the normally regular and symmetrical method of cell division, and assumes an atypical mitosis. This atypical or asymmetrical mitosis is inherited by the progeny of the original deflected epithelial cell, and thus an atypical growth of epithelium or an epithelioma is produced.

Dr. Van Gieson could not corroborate Hauseman's findings of asymmetrical figures in quite an extensive examination of epitheli-

omata especially prepared to demonstrate karyokinetic figures. In this examination the irregular and atypical figures pictured by Hauseman were not verified. On the contrary, the figures appeared uniformly regular and symmetrical, as in normally growing tissues. The speaker had observed that in slowly growing epitheliomata these figures were very few in number, and even difficult to find, while in the more malignant growths they were very numerous, and quite extensively distributed through the sections. This contrast in the number of the mitotic figures, in the benign and malignant growths, is so striking that the number of figures present in the section may be regarded as a fairly reliable index of the malignancy of the growth, and a valuable aid in the diagnosis under the microscope.

Dr. Fordyce said he had not yet personally examined the specimens with reference to this point, but others had done so for him, and had found only very few of these figures.

A FATTY AND CIRRHOTIC LIVER.

Dr. J. W. BRANNAN presented a liver taken from a very stout man, thirty-six years of age, who had been brought into the hospital for acute alcoholism. He was somewhat jaundiced. No further history was obtainable. At the autopsy, abundant deposits of fat were found in all the organs, but the liver was of special interest. From its general appearance, two experienced pathologists were led to make a diagnosis of hypertrophic cirrhosis. The liver weighed ten pounds. Dr. Hodenpyl examined it microscopically, and found fat in the acini, and a development of cirrhotic tissue in Glisson's capsule, the fatty degeneration seeming to be the more prominent feature.

TRICHINOSIS.

Dr. G. A. TUTTLE said that on November 14, 1892, three cases of trichinosis were admitted to the Presbyterian Hospital. All three patients had eaten raw pork on October 23d, and for about ten days after that they presented no symptoms. The father then began to complain of slight loss of appetite, and this was followed by three days of diarrhœa, accompanied by much prostration. Soon after this the muscular pains developed, with œdema of the extremities and face. On admission, motion of the muscles or

pressure on them was very painful, and there was moderate fever. Three or four days before the death of the man, he began to show symptoms of paralysis of the diaphragm, and this increased until the respirations became entirely thoracic, and he finally died of exhaustion. A few days before his death, a portion of the gastrocnemius muscle was removed, and was found to contain large numbers of trichinæ. The other cases are now recovering. At the autopsy on the man, the parasites were found in the bowel, and especially at the entrance to the veriform appendix where were also found the parent trichinæ.

Dr. Prudden said he would like to know how frequently chance cases of trichinosis were met with in this city. He thought that at least one case of this kind was found each year in the anatomical department at the College of Physicians and Surgeons.

The President said that three cases had been seen at the University Medical College last winter, two of them being in the dissecting room.

Dr. H. M. Biggs said that in an experience of six years in the anatomy room, where there were at least 150 subjects annually, he had only seen one case of marked trichinosis and one or two others in which a few trichinæ were found. While watching autopsies in Germany, he had been struck with the much greater frequency of trichinosis there.

A FOREIGN BODY IMPACTED IN THE PYLORIC END OF THE
STOMACH.

DR. IRA VAN GIESON said that he was indebted to Dr. Jenkins of Brooklyn for the interesting specimen which he had to present. Four years prior to the death of the patient, who was a robust man fifty-five years of age, he was seized rather suddenly with intense epigastric pains, which were excited each time he took solid food. After about four months, there was an interval during which the pain was not so severe, and then the symptoms were suggestive of pyloric stenosis, or of beginning carcinoma in this region. The man became greatly emaciated, and ultimately died of chronic phthisis. The stomach was of normal dimensions, but before opening it, a solid body could be felt in the pyloric orifice only about one quarter of an inch in either direction. On opening the stomach, a peach-pit was found embedded in the pylorus, but not projecting into the duodenum. This body

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seemed to act as a ball-valve, thus explaining the variations in the severity of the symptoms. If there were no stenosis present, a body capable of passing the pylorus should be able to pass the duodenum, but on examining the specimen closely it will be seen that the junction of the duodenum with the stomach is decidedly narrowed.

Dr. Thomas H. Manley did not think it probable that a peach-pit could resist the action of the gastric juice for four years; besides this, it did not seem to him of sufficient size to give rise to the severe pain from which the patient suffered. He would like to know the experience of the other members regarding the frequency of such foreign bodies in the stomach.

Dr. H. M. Biggs could not recall having seen a single case of this kind, and Dr. Prudden recalled the infrequent occurrence of hair-balls in the stomach. The specimen from one such case, which had been shown to the Society, was in the Museum of the College of Physicians and Surgeons.

DR. E. LE FEVRE exhibited a specimen of

FILARIA SANGUINIS HOMINIS,

and showed the chylous urine which had been passed by the patient at 2 A.M.

The President said that some idea could be obtained of the large number present in the specimen, from the fact that about forty small fragments from the urine were teased out and examined under the microscope, and in about twenty of these specimens the filaria were found.

DR. THOMAS H. MANLEY presented specimens of

HERNIAL SACS.

The first was removed from a patient who had been operated upon by another surgeon for the relief of a strangulated indirect inguinal hernia, but without removing the obstruction. When first seen by the speaker, the patient was apparently in collapse, so under cocaine anæsthesia the wound was re-opened, a constriction at the internal ring divided, and the sac removed. The patient made a good recovery. The second specimen was taken from a patient who had suffered several years with colic and attacks of vomiting. The tumor gave no impulse on coughing,

and the examination led him to believe that it might be a new growth. An exploratory incision was made under cocaine anæsthesia, and the sac exposed, which contained three ounces of serous fluid. The sac was adherent to the surrounding tissues, but the old and firm adhesions were carefully separated, and the sac removed.

DR. MANLEY reported a case of a young man who, after an apparent attack of peritonitis, six weeks ago, noticed a fulness in the left inguinal region. This swelling became very tender, and there was some vomiting. On admission, there was a smooth, tense swelling situated between the external and internal rings, and on making an exploratory puncture pus was withdrawn. An incision then evacuated a large quantity of pus from a fæcal abscess, and examination showed that a portion of the sigmoid flexure of the colon had become strangulated at the internal ring, and that this had resulted in a spontaneous inguinal colotomy.

THE PRESIDENT presented specimens from

A SUPPOSED CASE OF ANTHRAX.

The patient was a tailor, twenty-four years of age, who had been in excellent health up to one week before his death. A small pimple was first noticed on the side of his mouth, and this he picked. He soon developed a cough and a high fever, and about the fourth day this pimple had become larger and decidedly indurated. Two days after this, he was so seriously ill that he was taken to the hospital. On admission, his whole face presented the appearance of erysipelas, and this was the diagnosis made at that time. On the following morning, the applications which had been made during the night had reduced the œdema, and the case was then diagnosticated as anthrax. At the autopsy, only two lesions were found, one in the mouth, and the other in the lungs. The former consisted of a necrotic area, one and a half inches long by one inch wide, extending from the angle of the mouth on to the cheek. The lungs showed twenty or thirty necrotic areas varying in size from one-sixteenth to one-fourth of an inch in diameter, of a grayish color, and found chiefly in the upper lobes of both lungs. The centres of some of these areas were whitish, and apparently contained cheesy material. Sections were made from the lungs, and from the lesion in the mouth, including the surrounding healthy tissue,

and cultures were made from the mouth and from the spleen. No anthrax bacilli were found, and many of the preparations, especially those from the mouth, were almost pure cultures of the staphylococcus. The case then is not one of anthrax, but a form of pyæmia, due to infection with staphylococci, which probably gained entrance through the large veins of the face. The small extent of the lesions and the rapidly fatal termination are the points of special interest in this case.

Dr. Fordyce said he was reminded of a very similar case which he had seen while in hospital. It was a well marked case of facial erysipelas which developed within thirty-six hours, an acute broncho-pneumonia, and ended fatally in a very short time. In this case, there was a descending phlebitis with multiple pyæmic abscesses in both lungs. It was not customary at that time to make cultures, so this part of the history is defective.

Dr. Prudden thought it had not been proved that the case under discussion was not one of anthrax, for Wechselbaum has recently shown that at a very early stage the bacilli of anthrax may entirely disappear from the local lesion, so that cultures made before death may be wholly negative, and yet in the secondary lesions the bacilli would be found alive. Moreover, staphylococci are quite commonly found in the mouths of people having catarrh. It is quite possible, therefore, in this case, that the bacilli may have disappeared from the local lesion, and the abscesses of the lungs may have been due to the staphylococci. It is possible that the staphylococci are more often present in the system than is generally supposed, and only await a sufficient constitutional disturbance to develop their activity. It is also possible in this particular case in view of the fact that the cultures from the spleen were negative, that the pulmonary lesions were not due to systemic infection, but resulted from the inspiration of the bacilli, and the formation of infarctions.

Dr. H. M. Biggs said that he saw a case last spring which supported the observations of Wechselbaum. It was a case of anthrax of the arm which began in the wrist. When first admitted to the hospital, it was sent to the erysipelas pavilion. Most of the arm was covered with very large blebs, and there were extensive hemorrhages into the cellular tissue. The patient was apparently doing very well, when suddenly one afternoon about three o'clock, he complained of severe pain in the head, at four o'clock he was delirious, and at eight o'clock the following morning he was dead.

The autopsy showed a most malignant form of meningitis with hemorrhages all through the meninges. All the cultures from the meninges gave pure cultures of the anthrax bacillus, while those from near the point of the original inoculation—the blebs and subcutaneous tissue—were absolutely sterile, and the tubes inoculated from the blood of the heart and spleen were also sterile. Preparations from the exudation also showed under the microscope large numbers of anthrax bacilli. At the time he saw this case, he was very much puzzled to explain the infection of the meninges without any evidence of constitutional infection.

Stated Meeting, December 14, 1892.

DR. H. P. LOOMIS, PRESIDENT, IN THE CHAIR.

DR. FRANCIS DELAFIELD discussed some of the forms of pneumonia, and illustrated his remarks by many fine photo-micrographs and slides projected on a screen by means of a lantern.

ENCYSTED OVUM WITH CALCAREOUS DEGENERATION OF
THE CHORIONIC VILLI.

DR. GEORGE C. FREEBORN presented "a card specimen," consisting of a uterus with attached fibroids, and a large cyst, together with the calcareous matter found in this cyst. The patient was a colored woman, who twenty years ago made an ineffectual effort to produce an abortion. Her abdomen gradually enlarged up to five years ago, when there was a sudden discharge of what she described as "small pieces of bone" and pus. The ovum was probably killed at the time of the attempted abortion and became encysted. Microscopical examination showed that the calcareous pieces were calcified chorionic villi.

DR. E. D. FISHER presented a specimen of

CARIES OF THE VERTEBRÆ AND COMPRESSION OF THE
SPINAL CORD.

The specimen is the last dorsal vertebra removed from a patient who had paralysis of the lower extremities, and more or less interference with sensation. An operation for the relief of the pressure symptoms had been attempted a few weeks before his

death, which occurred from exhaustion. His object in showing the specimen, was to call attention to the fact that the bone did not make pressure on the cord, but that an inflammatory exudate had formed outside of the dura mater, giving rise to a pachymeningitis, and to narrowing of the cord at this point. This is the origin of the pressure in most of these cases, and on this account it is not probable that operation can hold out much prospect of benefit. In the specimen presented, there was a softening of the cord at the point of pressure, and it was probably due to secondary degeneration, as no other spots of softening were found in the cord.

FILARIA SANGUINIS HOMINIS.

DR. E. LE FEVRE presented a series of specimens of chylous urine, showing the changes in its appearance during the twenty-four hours. He also exhibited the patient, a man, twenty-two years of age, a native of British Guiana, who came to this city four years ago. He presented no symptoms of this condition until last July, when he noticed a change in the appearance of the urine, and about the same time began to suffer from headache. There were no other subjective symptoms. Preceding the appearance of the chylous urine, there was a gradual enlargement of the scrotum. This swelling is apparently not a hydrocele; it is possibly the beginning of an elephantiasis from the stopping up of the lymph channels. At the last meeting of the Society, he had exhibited some of the urine, and also the filaria, but since then he had been unable to find the latter. The patient had been under treatment until recently at the Roosevelt Hospital with picrate of ammonia, and it was possible that he was just beginning to exhibit the good effects of this treatment.

Dr. EUGENE HODENPYL presented specimens of

PURULENT OTITIS MEDIA WITH CEREBRAL SYMPTOMS,

removed at autopsy from a man, fifty-five years of age, who had had a purulent otitis media on the right side for many years, but which stopped discharging about two weeks ago. He then began to suffer from fulness in the head, vertigo, and vomiting, and on December 3d he became delirious and blind. Since then there had been rapidly increasing paresis and numbness of the legs. Family and personal history good. On admission to the hospital, pulse 100 and regular, arteries thickened, respirations 20, tem-

perature 99.4° ; memory faulty, does not know where he is. There was no knee-jerk present, but paresis of both legs and arms, and considerable ataxia. Physical examination was negative. His urine had a specific gravity of 1024, was acid in reaction, and contained a faint trace of albumen; microscopical examination was negative. On December 13th it was noted that he was a little more rational; the right limb was strongly adducted in tonic spasm, the left forefingers strongly extended, and the whole body in marked opisthotonos. At this time his sight had returned, the pupils were equal, and he continually beat the right arm spasmodically against the bed.

With such a history, one would expect to find either a purulent meningitis or an abscess of the brain; but the gross appearance of the meninges is normal. A microscopical examination has not yet been made; it is possibly a cellular meningitis. On the surface of the liver are a number of deep furrows with firm adhesions to the under surface of the diaphragm. Glisson's capsule is very much thickened about these furrows, and fibrous tissue extends down into the organ to a considerable depth. The middle and lower lobes of the right lung contain patches of fibrous tissue, which, in view of the condition of the liver, are quite probably areas of syphilitic interstitial pneumonia.*

Dr. E. D. Fisher said that he had seen recently a case of otitis in which there were cerebral symptoms, especially paralysis, but further examination showed the case to be one of alcoholic multiple neuritis, a condition in which mental disturbance is not infrequent.

Dr. Hodenpyl remarked that his patient gave only a moderate alcoholic history.

DR. HODENPYL also presented specimens from a case of

PUERPERAL SEPTICÆMIA.

The patient was delivered seven days ago. At the autopsy the abdominal and pleural cavities contained considerable clear serum, and the lower lobes of the lungs were so compressed as to contain scarcely any air. One kidney presented the appearance of a large white variety, and the other the atrophied form. The uterus was three inches in depth, and contained a large quantity

* At a subsequent meeting Dr. Hodenpyl reported that the microscopical examination of the meninges from this case showed no lesions of any kind.

of material resembling retained placenta, but the walls of the uterus appeared to be perfectly normal. A bacteriological examination was being made.*

DR. D. H. McALPIN presented specimens of

TUBERCULOSIS OF THE GENITO-URINARY TRACT.

The patient was admitted to the hospital one year ago suffering from tubercular laryngitis, and there were also numerous areas of tubercular consolidation in the lungs. Eight months ago there was some swelling in the testicle, attended with pain, but these symptoms subsided. At the autopsy, the lungs were found to be filled with small tubercles; in the pelvis of the left kidney was a large cheesy mass from which tubercles radiated; in the ureter there was a small ulceration; in the bladder, near the trigone, were numerous foci of inflammation, and the testicle was studded with tubercles and contained a large cheesy mass.

DR. J. M. BYRON presented three tubes containing

CULTURES OF TUBERCLE BACILLI.

One contained the bacilli from human sputum, a second contained bacilli from birds, and the third, an old culture, obtained from guinea-pigs by inoculating them with the sputum from human beings. The culture in the first tube consisted of dry, granular heaps on the surface of the agar-agar; that in the second, of a slimy layer on top of the culture medium; and the third, a thick, creamy layer in which the cultures had become confluent, and had covered the entire surface of the agar-agar. There is a great difference in the rapidity of the growth of these different varieties of tuberculosis, thus: if the culture from the human subject take two weeks to grow, that from birds would take three or four weeks, while the culture from the guinea-pig would only take one week.

ULCER OF THE STOMACH WITH PERFORATION; CIRRHOSIS OF THE PANCREAS.

DR. H. S. STEARNS presented a specimen which explained the rather sudden death of a woman sixty-five years of age, who for

* Bacteriological examination in this case showed the presence of the streptococcus pyogenes in the heart's blood, abscess of the lung and spleen. Sections from the mass in the uterine cavity proved it to be placental tissue.

several years past had complained of wandering pains over the abdomen. She was transferred to the gynæcological ward for examination, and on the two evenings following the examination had severe hæmatemesis. At the autopsy, a large ulcer with overhanging edges was found at the cardiac end of the stomach. At this point there were many adhesions of the stomach to the spleen and liver, and between the adhesions to the liver and those to the spleen was a large cavity filled with clotted blood, and a perforation from this sac into the stomach. Examination showed very extensive cirrhosis of the pancreas.

A GUMMY TUMOR OF THE CEREBELLUM.

DR. CHARLES E. BRUCE presented the brain from a man, twenty-eight years of age, who was admitted to the almshouse hospital on September 17, 1892, because of blindness. On the morning of the 21st, he had a convulsive seizure followed by right hemiplegia and coma, and he died on the following day. No history was obtained from him, but the nurse said that the patient had a slight staggering gait, with a tendency at times to fall towards the right, and that he had said that he had had "fits" before, and that he had been thirteen weeks "going blind." It was noted in the hospital that the left pupil was contracted, and the right dilated; that his respiration was stertorous, and the coma profound.

At the post-mortem examination the cerebral surface was found to be congested, and the sinuses engorged with blood. The dura was free, but the pia mater was adherent to the cortex, and there was a slight but very adhesive plastic exudation. The ventricles were dilated and filled with blood-stained serum, and the brain tissues were quite soft. On the inner surface of the cerebellum on the left side, near the pons, was a tumor, measuring $1\frac{3}{4}$ inches in diameter; it was bound down by recent lymph. Dr. Thacher had examined the specimen, and had pronounced the tumor a gumma. The interesting feature in the case was the absence of all symptoms of cerebral compression, except the convulsive seizure.

RUPTURE OF THE LIVER; FATAL HEMORRHAGE.

THE PRESIDENT said that rupture of some one of the abdominal viscera is a frequent result of severe injury. The solid organs

suffer much more frequently because of their fixity, density, and close proximity to bony structures. Of the solid organs, statistics show that the liver is most often injured, then the uterus, spleen, kidney, in the order named. The stomach is least often injured, and but a few cases are on record. The liver suffers most often because of its position beneath the ribs, and against the spine, and because it is firmly held by strong ligaments and large vessels. In rupture of the liver, the most convex part of the upper surface gives way first, generally in the right lobe. The specimen presented showed a rupture in this situation. On the surface of the organ was a fissure $3\frac{1}{2}$ inches long, and $\frac{3}{4}$ inch deep at its deepest portion. The laceration appeared to have occurred by a tearing or stretching of the tissues, and not to have resulted from a direct blow. The liver weighed $4\frac{3}{4}$ pounds, and was rather pale. Fluid blood was on the surface of the liver, and about a pint was found in the abdominal cavity. There was a slight hemorrhage in the perinephritic fat of the right kidney. With these exceptions, all the abdominal organs were normal. The upper lobe of the right lung was firmly bound to the chest-wall by old pleuritic adhesions. In these adhesions were small hemorrhages of recent origin, presumably the result of the traumatism. No lesions of the thoracic viscera were found. The history of the case is as follows: A man, forty-two years of age, in perfect health, was crossing the street when he was knocked down by a beam projecting from a truck which was turning the corner. As the beam swung round, it struck him on the right side. He died on the street before medical aid could reach him. No mark of the injury was seen on the surface of the body, there were no ecchymoses or contusions. This absence of external evidences of traumatism in rupture of the liver has been noted in a number of cases, and might account for the diagnosis of spontaneous rupture of the liver which has been made in a few cases, but which I believe never occurs. Another fact in rupture of the liver is, that the majority of cases are fatal.

THE PRESIDENT also presented specimens of

SUDDEN DEATH FROM PERFORATION OF THE LUNG IN A CASE
OF ACUTE PULMONARY TUBERCULOSIS.

The patient, thirty-two years of age, died suddenly while sitting in a chair in one of the wards of Bellevue Hospital. He had just

been admitted to the hospital, and no history of the case had been obtained. The autopsy, twenty-four hours after death, revealed the left pleural cavity filled with air, the lung compressed against the vertebral column, and at the apex, bound down by old adhesions. No fluid was found in the pleural cavity. Both lungs were riddled with small cavities, varying in size from a pea to a small cherry. There was not a vestige of pulmonary tissue left in the right lung, and only the lower lobe of the left lung was in a condition to functionate properly. The upper lobe was completely filled with solid tubercular masses and with minute cavities.

Stated Meeting, December 28, 1892.

DR. H. P. LOOMIS, PRESIDENT, IN THE CHAIR.

DR. MARTHA WOLLSTEIN presented a specimen of

RHABDO-MYO-SARCOMA OF THE KIDNEY

which had been removed by Dr. Robert Abbé at the Babies' Hospital from a baby one year old. Some abdominal enlargement had been noticed for two months, but it was only during the last two weeks that there was any very noticeable increase in the size of the abdomen. The general health remained good. The tumor was found to involve only the upper part of the right kidney; the ureter, pelvis, and lower portion of the kidney being normal. The tumor weighed 3,650 grammes, and measured 20 by 15 by 34 centimetres. It was made up of small round masses, and had a distinct fibrous capsule, which was continuous with the capsule of the kidney, and the parenchyma of the kidney was also continued for a short distance over the lower part of the tumor. Apparently the growth began in the parenchyma of the kidney, and gradually pushed it aside. The fresh specimen on section presented the ordinary appearance of a sarcoma, except that in some places it was softer and redder than in others. Microscopical examination showed it to be a small round-cell sarcoma, containing an abundance of striated muscular fibres. These fibres were much narrower than in adult muscle. The sarcolemma is said to be absent in such cases, and the speaker said she had been unable to demonstrate its presence in the specimen. In the younger muscular fibres, the nuclei were in the centre, and the

striation in the periphery only, thus showing very distinctly the development of the muscular fibres.

There are two theories to explain the development of such tumors ; one, that of metaplasia, which claimed to prove the transformation of smooth into striated muscle, and the other, that of Cohnheim, which assumes an error in development, or the inclusion of an embryonic rudiment in an anomalous place. According to the first theory, the growth would originate from the muscle cells normally present in the capsule of the kidney, and in the walls of its pelvis, ureter, and blood-vessels. Ribbert, who was the chief supporter of this theory in 1886, has, in 1892, admitted that his later studies have not borne out his earlier views. The origin of the two kinds of muscle from totally different embryonic cells makes this theory untenable. According to the second theory, the development of the kidney and of the striated muscular tissue from two portions of the same mass—the axial mesoblast, makes it possible to understand that some of the cells which will form muscle may wander in or become surrounded by some of the adjacent cells which are to form the kidney stroma.

Only twelve similar cases of rhabdo-myo-sarcoma of the kidney have been reported as occurring in children, and one in the adult. Of the twelve cases occurring in children, one reached eight years of age, one four, four died between the second and fourth years, and four between the first and second years, and one at the end of eight months. This seems to support the theory of foetal inclusion. In not a single case was there a history of the existence of a swelling at the time of birth. Metastatic deposits were present in only three of the twelve cases—one in the serous coat of the diaphragm, one in the liver, and in one only small nodules of sarcomatous elements were found in the liver. Both kidneys were involved in three cases, and in one of these the growth began outside of the kidneys, and involved these organs secondarily. In two other cases, the growths were polypoid and seemed to come from the wall of the pelvis of the kidney, and in one of these a small polypoid mass was also present in the ureter.

DR. J. W. BRANNAN presented a specimen of

RUPTURE OF AN ANEURISM OF THE ABDOMINAL AORTA
INTO THE DUODENUM.

The patient was a very fat man, seventy-three years of age, who ten years ago had a fall on the chest, which was followed for a

time by more or less dyspnœa and epigastric pain, and occasional vomiting. He continued, however, to have fair health up to last February, when he was seized with very severe pain in the region of the appendix. These symptoms also soon subsided, and he did well up to December 20, 1892, when his attending physician, Dr. Lellman, was summoned, because the man had vomited considerable blood, and had also passed considerable blood from the rectum. That evening there was another severe attack of this kind, and a third one on the following evening. The next morning, December 22d, he felt so much better that he got out of bed; there were almost immediate symptoms of collapse, and he died within fifteen minutes. The autopsy was made on the following day. The intestines and stomach were filled with blood, and an aneurism was found springing from the abdominal aorta about one inch below the renal artery. It was very firm and measured three inches at the base and three inches in height. The transverse portion of the duodenum was firmly adherent over it, and there was a minute opening from the aneurism into the duodenum. The aneurismal sac was filled with a firm clot. The remainder of the aorta contained numerous calcareous plates and spots of ulceration. There was no other lesion of the stomach or intestines.

This condition is exceedingly rare. The records of this Society show eight cases of rupture of an abdominal aneurism into the surrounding tissues, and in not one of these did it take place into the duodenum. In two of them, the rupture was into the peritoneum, in two behind the peritoneum, and in two into the pleural cavity. The records of the London Pathological Society for the past forty years show eleven cases of rupture of abdominal aneurism, and in only three of these did it rupture into the intestines—twice into the duodenum, and once into the descending colon. The probable explanation of the rarity of this form of rupture is that three-fourths of all abdominal aneurisms are situated above or below the point where adhesions with the duodenum are likely to form, and half of all such aneurisms grow from the posterior surface. The large firm clot in the aneurism just presented probably reduced the force of the pulsation considerably, and the very abundant adipose tissue in this patient interfered so seriously with palpation, that the existence of this aneurism was not even suspected during life.

A HORSESHOE KIDNEY IN DOUGLAS' POUCH.

DR. J. M. BYRON presented a kidney of peculiar form—not a true horseshoe kidney—but rather of a sigmoid shape. The specimen was removed from a woman who died in Charity Hospital, and it was of special interest because of the fact that the lower portion of the kidney lay in Douglas' pouch. Both the renal arteries in the specimen were derived from the aorta, the one for the right kidney being in its normal position. This kidney was situated in front of the last lumbar and the first sacral vertebræ. In an examination of the literature of this subject, he had been unable to find another case in which the kidney was in this peculiar situation, which is of importance on account of its surgical bearings.

Anniversary Meeting, January 11, 1893.

DR. H. P. LOOMIS, PRESIDENT, IN THE CHAIR.

HEMORRHAGIC PANCREATITIS.

DR. GEORGE P. BIGGS presented specimens from two cases of this very rare condition. He said that a search through the records of the Society showed that, although several cases of necrosis and suppuration had been reported, there had been only one case of hemorrhagic pancreatitis, and this was reported in 1853, and the description was rather defective.

The first specimen which he presented had been found yesterday at an autopsy on a German laborer, thirty-two years of age, who had been taken suddenly at 2 P.M., January 6th, with intense pain in the right side at the junction of the right inguinal and lumbar regions. Shortly after this he began to vomit. Previous to this attack, he had been in good health, although a heavy drinker. When admitted to the Chambers Street Hospital at 2.42 P.M., he also complained of severe pain in the epigastric region; his pulse was rather slow, the temperature 100°; the abdomen very rigid and somewhat distended. Palpation revealed nothing. He had been drinking heavily for two days. A diagnosis was made of perforating appendicitis with acute general peritonitis, and an operation was advised, but consent was withheld until too late.

His pulse soon became rapid and feeble, vomiting of bile was frequent, and he tossed about the bed, holding his hand over the seat of pain. He had been somewhat constipated. Death occurred twenty-four hours after the onset of the pain.

The autopsy was made after a delay of two days, but in the interval the body was frozen. Much to the surprise of those who had seen him during life, there was no peritonitis, the vermiform appendix was perfectly normal, and, with the exception of the pancreas, nothing was found in the organs except changes due to alcoholism—fatty liver, and a moderate amount of chronic nephritis. The intestines were filled with a large quantity of mucus, which contained the usual amount of bile. In the location of the pancreas a very dark mass could be seen through the peritoneum; this proved to be the pancreas enlarged to three or four times its normal dimensions, and its head projecting considerably to the right of the spinal column, displacing and compressing the duodenum. It was 16 ctm. long and about $6\frac{1}{2}$ ctm. transversely and vertically. The entire organ was of a reddish-brown color, and to the naked eye presented no trace of pancreatic tissue, looking like one large firm clot. Scattered through this mass were very dark spots, probably the site of older hemorrhages. The layers of fat between the layers of the mesentery were also extensively infiltrated with very dark blood, the infiltration extending down the sheath of the left psoas muscle. There was no fluid blood at any point. A probe could be easily passed through the duct of the pancreas. No microscopical examination had yet been made.

The second case was also in Chambers Street Hospital. He was a German laborer, forty-five years of age. Nothing could be learned of his previous history except that he had been intemperate in his habits. Two days before his death, there was a gradual development of dyspnœa and pain in the epigastrium. There was vomiting, but it was not so severe as in the first case. The dyspnœa was the most marked symptom, and was so severe, that he was obliged to sit up in bed with the hands over the abdomen. His pulse was very rapid and feeble. He died two hours after admission to the hospital. On account of the short time he was in the hospital, no accurate observations were made of his condition.

At the autopsy, the pancreas was found considerably increased in size, measuring 20 ctm. in length by 6 ctm. vertically, and 4 ctm. antero-posteriorly. The entire organ was of a brownish-black color, and to the naked eye no distinct pancreatic tissue

could be seen. In this case there was extensive infiltration of the dark blood into the surrounding cellular and adipose tissue, and in addition to this, behind the peritoneum, between the tail of the pancreas and the diaphragm, there were about one and a half pints of fluid blood. This was the main point of difference between this and the former case. Some of the hemorrhage seemed to be old, as the sections under the microscope showed considerable black pigment. They also showed extensive destruction of the pancreatic tissue, and extensive fatty change in the portion still remaining.

The history in the first case is that usually given. Fitz, in his paper read before this Society in 1889, reported seventeen cases of this condition, which he had been able to collect, and the appearances he described correspond to those just reported. Virchow recently spoke of it as one of the rarest conditions found on autopsy. Both patients were well developed men with much adipose tissue, and this was also noticed in most of the cases reported by Fitz.

Dr. Hodenpyl asked if there was a history of syphilis, and whether or not there were lesions of the blood-vessels elsewhere.

Dr. Biggs replied that, owing to the unavoidably imperfect history, he could not speak definitely about the existence of a syphilitic history, but there were no lesions of the blood-vessels, and the hemorrhage was almost exclusively into the interstitial tissue of the organ.

FRACTURE OF THE SKULL AND SYMPTOMS OF INSANITY.

DR. BIGGS then presented a specimen from an autopsy made a few days before on a man who had been committed to the Bloomingdale Asylum as insane. Thirteen days before death, the man was found wandering around the street, and unable to give an account of himself. No history could be obtained. There were no signs of injury. He was taken to one of the hospitals of the city, and as he had been drinking heavily his condition was supposed to be largely due to alcoholism. He was in the hospital several days, during which time he imagined himself back at his work, and tried constantly to get out of bed. He was then transferred to Bellevue Hospital, and there pronounced insane. His friends had him transferred from the Insane Pavilion to Bloomingdale Asylum, where he died rather suddenly. No positive

diagnosis had been made, but the case was supposed to be one of general paresis. One of the orderlies stated that he had noticed that the man moved his right arm and both legs without difficulty, but did not move the left arm. The autopsy showed a fracture of the skull, beginning about one inch above the external auditory meatus on the right side, and running downwards and forwards. There was a large extradural clot, three and a half inches in diameter, and one inch thick; there was no fluid blood. The clot produced lateral compression of the temporo-sphenoidal lobe on the right side; the leg centre was not involved. The only other changes found in the organs were those due to alcoholism. The case was of interest on account of the error in diagnosis, and the length of time elapsing between the receipt of the injury and death.

OBSTRUCTION OF THE BOWEL BY PELVIC ADHESIONS.

DR. BIGGS also presented a specimen showing changes following chronic pelvic abscess. It was removed from a woman thirty-five years of age, who had been tapped twice through the vagina, and pus evacuated from the cul-de-sac. She did well for a time, but finally returned to the hospital, greatly emaciated, and apparently suffering from pulmonary tuberculosis. There was also intestinal obstruction. The autopsy showed no tuberculosis of the lung, but extensive bronchitis and pulmonary oedema. The large intestine was found to be enormously distended, evidently from an obstruction in the rectum. The uterus was small, and there were extensive adhesions from the upper border of the uterus directly backward to the rectum, completely closing off the portion of the pelvis below this, and in this mass of tissue behind the uterus was an old abscess cavity filled with pus. Both Fallopian tubes near the uterus were quite small, and the canal could not be followed; but the outer portion of the tube was considerably dilated, and a probe could be passed from the dilated tube out through the fimbriated end into the abscess cavity. The visible cavity measured 3 x 2 ctm., and communicated with another abscess passing across and behind the uterus.

It was interesting to note that the origin of the trouble was tubal. A firm band of fibrous tissue, nearly half an inch thick, surrounded the middle portion of the rectum, causing so much obstruction that it was with difficulty that the little finger could

be forced through the opening. Above this point there was very marked dilatation of the gut, and in the sigmoid flexure and ascending colon there was very extensive diphtheritic inflammation.

TUBERCULAR ULCERATION OF THE VERMIFORM APPENDIX.

DR. E. HODENPYL presented a specimen showing one result of an attack of appendicitis. The patient was a young man who died in the hospital from acute phthisis. There was no history of appendicitis. The appendix measured about six inches in length, was twisted on itself, and entirely shut off from the abdominal cavity by old adhesions containing some blood-vessels. The appendix was almost the size of the little finger, and on the inner surface, and about the orifice of the appendix were ulcerations which, on examination, proved to be tubercular. There were no other ulcers in the intestines; in fact, no lesion in any of the other abdominal organs. There was no foreign body in the appendix.

PERFORATING ULCER OF THE STOMACH.

DR. HODENPYL also presented a specimen from a woman, twenty years of age, who had suffered from various gastric symptoms of moderate severity for about one year previous to her death. The day before her admission to the hospital she ate a very hearty meal, and almost immediately complained of severe pain in the epigastrium, which was soon followed by symptoms of general peritonitis. She was taken at once to the hospital, but died within six hours. At the autopsy, an opening was found in the anterior wall of the stomach near its middle. It was about half an inch in diameter, round, and its edges were considerably thickened. The abdominal cavity contained considerable partly digested food, and there was an intense general peritonitis just beginning.

At a meeting of this Society last November, there was some discussion as to the frequency of these ulcers, and the conclusion reached was, that they were not so common as the books would lead us to believe; yet, although he had seen very few up to that time, he had met with four such cases since then.

CEREBRO-SPINAL MENINGITIS.

DR. W. P. NORTHRUP presented the brain and spinal cord from a child, three years of age, on whom an autopsy had just been made. The case was one of cerebro-spinal meningitis, and the chief feature was that the inflammatory lesion was largely in the ventricles. All the ventricles were distended, and contained pus and fibrin. The exudation about the cord was all on its posterior surface; all the fissures of the brain were glued together, and there was a moderate exudation of pus.

The history of the case, which was a rather unusual one for cerebro-spinal meningitis, was as follows:

On Dec. 1st., the child was convalescent from measles. During the night, there was a chill, followed by vomiting with great restlessness, and in the morning, the temperature was 105° , the pulse was 140, the respirations 58, and the face and throat were congested. An examination of the lungs was negative. On the following day, the morning temperature was 104° , there was some ulceration of the throat and tonsils, and some tenderness of the neck. At 12 M. the temperature was 107.8° , respirations 44, and the pulse 159. On Dec. 5th, the respirations were irregular, the temperature was 103.6° , the head was retracted, and there was tenderness about the neck and whole body, and the child had a shrill cry. On Dec. 10th, the temperature was 107.8° , the stupor was increasing, there was strabismus and twitching of the face, and irregular respirations. No opisthotonos was present, which seems rather remarkable in view of the fact that the exudation extended the whole length of the cord, and was on the base of the brain. On Dec. 16th, the temperature was 105° , the child was very irritable, and the reflexes were entirely abolished. On Dec. 26th, it was noted that there had not been much change. On Jan. 1st, there were vomiting and diarrhoea, incontinence of urine and faeces, and the temperature was 103° . On Jan. 9th, the child died, and the temperature just before death was 108.6° . There were no convulsions, no paralyzes, no opisthotonos, and no eruption.

THE PRESIDENT presented a specimen of

SARCOMA OF THE ANTERIOR MEDIASTINUM.

It was taken from a young Bohemian, who was admitted to Bellevue Hospital on December 24th. During the ten days he

was there, he was examined by a number of the visiting staff, but no diagnosis was made. There were two prominent symptoms—severe and persistent nasal hemorrhages, and a high temperature. For the greater part of the time the temperature was 103° , but once or twice it reached 106° . He was greatly emaciated and very anæmic. No definite history could be obtained. There was slight glandular enlargement on one side of the neck, but no pressure symptoms. There were no physical signs excepting a blowing murmur over the heart. The autopsy was made thirty hours after death, and on removing the sternum a smooth and hard mass was found filling up the anterior mediastinum, extending from just above the supra-sternal notch downward over the pericardium. It was not adherent, and on opening the pericardial sac, no connection could be found between the mass, which was attached firmly to the parietal portion of the pericardium and the heart itself. The vessels were not obstructed. The mass proved on examination to be a small round-cell sarcoma. There were no other growths found.

An examination of the literature of the subject showed that such sarcomata were quite rare. Only two cases have been reported in this Society since 1885, and the records of the London Pathological Society for the past fifteen years show only eight cases of sarcomata of the mediastinum—five of lympho-sarcoma, one round-cell, and two spindle-cell sarcomata. The most exhaustive monograph on this subject is that of Hare of Philadelphia. His conclusions from the 520 cases which he collected, are as follows: Cancer is more frequently found in the mediastinal spaces than any other morbid process. Abscess is the next most frequent; then, in the order of their frequency, come sarcomata and lymphomata. Most mediastinal growths occur in adults, and more frequently in males. Cancer and sarcomata in these spaces are always fatal. Abscesses are recovered from in about forty per cent. of the cases. One hundred and thirty-four of these tumors were cancer, 98 were sarcomata, 115 were abscesses, 21 were lymphomata, 7 were fibromata, 6 hæmatomata, 11 were dermoid cysts, and 8 were hydatids.

In conclusion, we may say that mediastinal tumors are commonly situated in the anterior mediastinum. Almost all sarcomata in the mediastinum are primary; when secondary, it is usually to sarcoma of the pleura; they invariably enlarge backward, and not forward.

Dr. J. S. Ely asked if the President had formulated any theory to account for the temperature.

The President replied that he thought in his case it might have been a so-called "anæmic temperature." In a very similar case reported to the London Pathological Society, mention is made of an elevation of temperature, and it was explained on the theory that there was a complicating pleurisy.

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